

AMULSAR
INDEPENDENT
ADVISORY
PANEL

ANNUAL REPORT

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Disclaimer: The Armenian version of this report is a translation of the original in English.
In case of a discrepancy, the English original shall take precedence.

Mr Howard Stevenson

Chief Executive Officer

Lydian International

26/1 Vazgen Sargsyan

Yerevan

Republic of Armenia

April 2018

Dear Mr Stevenson,

This letter prefaces the Amulsar Independent Advisory Panel's first annual report, prepared in accordance with our Terms of Reference. Since you took the step of establishing the Panel last April, we have undertaken extensive engagement with a range of stakeholders of the Amulsar project, including by means of two sets of Panel meetings in Armenia. We have drawn on this engagement, as well as our own research on the project and our prior expertise, to inform the following independent appraisal of the project's management of social, environmental and governance issues.

I hope that you will find our recommendations to be balanced, fair and useful. We recognise that Lydian has undertaken a number of steps which go beyond what have, hitherto, been routine social and environmental practices in Armenia. Nonetheless, we have identified a number of instances where, in our view, your performance could be improved either as a matter of substance or because doing things in partnership with stakeholders would help to build trust.

The report presents our findings and sets out our recommendations to Lydian. Our Terms of Reference raise the prospect that the company will make a formal response but whether you choose to do so is entirely within your discretion. Together with my fellow panellists, I look forward to continuing our work over the next year.

Yours sincerely,



Dr John Harker

ACKNOWLEDGEMENTS

The Panel would like to thank Bob Carreau (former VP Sustainability at Lydian International) for his support of the Panel's work. We recognise the good work that Bob, as a seasoned industry professional, has overseen in his role, and are pleased that this vital role will now be filled by a highly qualified and well-respected Armenian professional, Dr Armen Stepanyan. We wish Armen well in his work and call on the company to support him strongly in his efforts to ensure the impact of its positive contributions to communities in the Amulsar area and Armenia more broadly.

The Panel would further like to express its gratitude to the London-based advisory firm Critical Resource for providing Secretariat support throughout its engagements.

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Please note that Panel members serve in personal capacities and do not necessarily represent the views of any institutions with which they are currently, or were previously, affiliated.

Executive Summary

In preparing this first report, the Panel has had an 'open-door' approach and drawn on interactions with communities near to the project site, representatives of civil society groups, academics, government officials, international institutions, technical experts and Lydian staff, in order to form an independent, objective overview of the Amulsar project's management of social and environmental impacts and of the way in which Lydian is meeting its commitments. Broadly, the Panel has found that Lydian has made some ambitious commitments to operate to high social and environmental standards and is, in its actions, largely displaying a determination to deliver against them. In particular, the company's work on biodiversity during the Environmental Impact Assessment (EIA) process, its engagement with local communities and its commitment to transparency seem to the Panel to demonstrate a strong commitment to sustainability and to a high standard of mining practice.

Nevertheless, the Panel has, at times, encountered stakeholder concerns about the perceived environmental and social impacts of the planned mine and, more generally, has noted a context of low trust. In particular, concerns have centred on apprehensions about the project's potential environmental and social risks in relation to impacts on local and regional water resources, including the potential for mining to generate acidic discharge ('acid rock drainage') and the planned use of cyanide in processing the ore. Additionally, as construction has ramped up, local employment and sourcing from local businesses, together with concerns about dust pollution, have become increasingly salient issues in the communities close to the mine site.

The central theme of the report is 'Responsible Mining'. International mining practices and expectations of the industry have moved on apace over the last twenty years, but Lydian has a significant challenge in making its exposition of 'international standards' resonate with Armenian stakeholders, most of whom are understandably unaware of these developments.

The report identifies some areas for improvement and to that end we have made a number of recommendations. Among other things, we call on the company to ensure it is taking a clear and long-term approach to its social investment and societal contributions more generally and to revamp its grievance mechanism. We also believe that the company needs to redouble its efforts to address the perceived 'trust deficit' by working with stakeholders to strengthen understanding and confidence – for example by implementing initiatives such as participatory monitoring programmes to track the project's environmental impacts in a transparent and inclusive way.

The project is at a critical moment as the move from construction to production is now on the horizon. This will present new challenges. In relation to the project's possible impacts on water, there has been particular stakeholder scrutiny of the potential for mining to generate acid rock drainage (ARD) with potentially harmful effects for local and regional water sources. The Panel has, in its ongoing engagement around ARD, found that Lydian's environmental impact assessments and management plans, and in particular its strategies emphasising prevention in preference to treatment, are in line with international good practice and at this stage are sufficient to mitigate any significant impacts, though we will continue to track closely

the company's performance in this area, recognising that this is a key issue for the project and its stakeholders. The Panel recommends that Lydian collaborates closely both with experts and the local communities to monitor, and determine sustainable solutions to, water-related risks.

Another important focus of the Panel's scrutiny has been the project's planned use of cyanide to separate gold from the ore. In light of the dangers that can be posed to human health and the environment from improper cyanide use, the Panel highlights Lydian's achievement in having attained pre-operational certification under the International Cyanide Management Code, an initiative aimed at ensuring safe cyanide management through regular audits and certification. In the Panel's view, Lydian is taking early and appropriate steps to ensure its use of cyanide can occur without adverse impacts to local people or the environment. It recommends that, given the importance of the issue, the company should continue to be fully transparent about its approach to cyanide management, including, as appropriate, briefing local communities on its approach.

As construction progressed it generated increased dust pollution, leading to complaints from some community members. Given that the company seems to have initially underestimated the extent of the problem during the dry and windy season, the Panel raised the issue with Lydian management on the conclusion of its September 2017 visit to the project site. Following the Panel's intervention, Lydian appears to have addressed its dust management with greater urgency and strengthened its mitigation measures, though the Panel will continue to monitor the situation closely as the dry season once again approaches.

In relation to biodiversity, Lydian has set itself the goal of achieving 'No Net Loss', with aspirations for the more ambitious goal of a 'Net Gain' where relevant. This means that flora and fauna populations in the Amulsar area should have the same chance of long-term survival with the project in

place as without it, and should have access to similar amounts of suitable habitat as that which currently sustains them.

As part of its efforts to achieve these goals, the company has signed a memorandum of understanding with the Armenian Ministry of Nature Protection to support the creation of the Jermuk National Park. If this were to be realised it would constitute a unique contribution, even by international standards, for a mining company. In the Panel's view, the project is, at this early stage, well-resourced to achieve its biodiversity goals and could even serve as a model of international best practice in this area. Nevertheless, the Panel is concerned that progress on biodiversity goals appears to be slower now than it was in the planning stage, and recommends that Lydian should ensure its approach to biodiversity monitoring and offsetting negative impacts is an ongoing and evolving process, with sufficient attention and resources continuing to be allocated to its success.

The provision of health services to its employees, and the company's broader efforts to help improve health services in the project area, constitute a further area of stakeholder interest and focus for our work. One area of improvement we have identified – and would urge Lydian to address – is the failure of some of its contractor companies to provide health insurance to their employees. In its interactions with Lydian management, the Panel has more generally emphasised the need for the company to treat health services as an integrated system and for it to take a collaborative approach with the government of Armenia in improving regional health data. While Lydian has shown itself to be receptive to the Panel's ongoing input on health issues and has made initial efforts to help improve health services in the Amulsar area, we urge the company to continue to develop its work in these areas and, crucially, to address health in a systematic manner.

Finally, the Panel has devoted significant time to scrutinising a range of social and community

issues. Although expectations for local employment are very high, local leaders acknowledge that Lydian has largely followed through on its commitments. The company's social investment projects and livelihood restoration activities also appear to have generated meaningful benefits for local communities, though the overall success of such activities can only be judged over the longer term. The Panel therefore urges Lydian to work to ensure local ownership of its initiatives, so that their benefits can be sustained over the longer term, particularly beyond the life of the mine. Two areas for improvement the Panel has identified are Lydian's contractor management, in which the

company should work to increase the share of local employment among its contractors' workforces, and Lydian's grievance mechanism which, while well-used, needs to be upgraded as the actual and potential impacts of the operations ramp up.

In setting out this summary, we are aware that much of the nuance contained in each thematic chapter may be lost and we would urge readers to scrutinise the more detailed sections on topics of specific interest to them. Finally, we have highlighted nineteen recommendations (see section 3) – ten solely for Lydian and nine that involve Lydian together with one or other of its stakeholders.

Background

The Amulsar gold project straddles the border between the two provinces of Vayots Dzor and Syunik. It presents a major economic opportunity for the region and, to an extent, the country as a whole. The project includes among its investors the European Bank for Reconstruction and Development (EBRD), which sets out demanding social and environmental requirements for any project to which it allocates capital. As a consequence, the mine is the first in Armenia to be planned and built in conformance with internationally recognised sustainability standards.

The Amulsar Independent Advisory Panel ('the Panel') was created in April 2017, on the initiative of Lydian International, to act as an independent source of advice and public scrutiny for the project. Appendix 2 shows the names and brief profiles of the Panel members. These individuals participate in their personal capacities, and do not represent any organisation with which they were previously, or are currently, involved. They were recruited with the objectives of achieving diversity between Armenian and international experts, and achieving coverage of the key sustainability topics of relevance to the project.



1. Chair's Foreword

For all its diversity, the Panel has with one voice recognised the potential of mining to contribute to the sustainable development of Armenia, a potential which can only be recognised, however, if what is in play is Responsible Mining¹.

By this we mean that mining must, at the very least, endeavour to achieve the best accepted international standards elaborated precisely to provide all concerned with as much certainty as possible that mining operations can, and will, be designed and executed to minimise risks and maximise benefits for stakeholders.

We will return to this point, but first, a word about process. The Panel was first able to interact through a series of teleconferences, involving Panel members, individuals from Critical Resource (a London-based advisory firm charged with providing the Panel with administrative and secretariat support) and, as appropriate, members of Lydian's sustainability leadership team, including the CEO.

In early May 2017, the Panel convened in Yerevan to begin the process of familiarisation with the project and of identifying how best to conduct its work, and travelled to the area around the Amulsar project, spending time in Gndevaz, Jermuk, Gorayk, Saravan and other affected communities.

This first visit shed important light on some key issues, and led directly to a range of initiatives which should be singled out. First, it was felt that a serious look at public health issues, both risks and responses, would be of benefit. The overall issue will be more fully addressed later in this report but here it should be noted that a Panel member was able to return to the area and cast an experienced eye over all aspects of health provision, with his subsequent report clearly influencing the company's thinking. We also made recommendations to the company on standard practice for mines in planning and preparedness² for emergencies – the implementation of which we will scrutinise in our next report.

Secondly, a Panel member with a long history of examining, and encouraging, meaningful company-community engagement in Responsible Mining, was able to spend five days visiting the project area and working with the Lydian team on how best to engage with local communities.

A third Panel member spent a day with the consultants who had managed the Environmental and Social Impact Assessment (ESIA)³. This provided valuable insights into the methodology employed during the ESIA process and why particular approaches were chosen. Subsequent discussions were also held with

¹ The International Council on Mining and Metals, an association of leading mining companies that aims to address the core sustainable development challenges faced by the industry, commits its members to ten best-practice principles of Responsible Mining; see <https://www.icmm.com/en-gb/about-us/member-commitments/icmm-10-principles/the-principles>.

² Based on the United Nations Environment Programme Awareness and Preparedness for Emergencies at Local Level (APELL) 2001 guidance document, see <http://wedocs.unep.org/handle/20.500.11822/8093>.

³ The terms Environmental Impact Assessment (EIA) and Environmental and Social Impact Assessment (ESIA) are used in this report to distinguish between the ESIA requirement imposed by international lenders and the EIA required by Armenian law. The two documents cover much the same ground but the ESIA, as might be expected, had a greater focus on social impacts and on the application of international best practices as opposed to national regulatory requirements. It was in the ESIA, for example, that Lydian made the commitment to establish an independent advisory panel.

Lydian's consultant who coordinated input to the EIA and ESIA on biodiversity and ecosystems, and this has further informed our observations on the company's performance on this topic.

In September 2017, the Panel returned to Yerevan and to the communities around the project site for a week of engagement. One item to be dealt with concerned the Panel's membership. To everyone's regret, Alisa Savadyan, an Armenian lawyer and environmental activist, stepped down from the Panel when her spouse, an experienced engineer, applied to join the Amulsar project team and was offered a role. Alisa immediately withdrew from the Panel to allay any concerns about the potential for a conflict of interest; our loss, but in some ways Armenia's gain.

Nonetheless, Panel members have been delighted that in her place we were able to welcome Nune Harutyunyan, a Director of the Regional Environmental Centre for the Caucasus, to our ranks. In view of the project's advance towards the production stage, we are also very pleased to be welcoming a leading expert in the responsible management of cyanide, Cathy Reichardt, to the Panel. The expertise of the new panellists will be very valuable to us as we continue to monitor the Amulsar project's ongoing performance on sustainability issues.

The two meetings in Armenia were followed in January 2018 by a meeting in London, where the

Panel gathered to focus on preparing this, our first report.

Moreover, we found great value in convening, via Skype or teleconferencing, monthly calls. For the most part, these calls involved Panel members and members of the secretariat. On one of the calls, we benefitted from a briefing by the European Bank for Reconstruction and Development (EBRD) on the audit process for ensuring that the Amulsar project remains in compliance with its best-practice social and environmental standards. On another occasion, we spoke with Larry Breckenridge of Global Resource Engineering, an expert working with Lydian on its acid rock drainage mitigation. The Panel was also grateful to have calls and meetings with representatives of, among others, the NGOs Bankwatch, Ecolur, EcoRight, and WWF Armenia. On a number of occasions, Lydian executives were invited to participate in the Panel's regular calls in order to answer questions on specific issues or more general developments. But on a few occasions Panel members talked among themselves, primarily to cement the perspectives which were emerging and would require further effort on their part; effort which we believe is reflected in this first report.

Thus it was that in these 'exclusive' discussions a strong feeling emerged that as the Amulsar project is, rightly, subject to an array of specialised 'auditing' and 'monitoring' requirements – reports to which



the Panel had full access – it would be more helpful, both to the company and the community, if the Panel focused principally on strategy or systems rather than points of detail, so long as details of non-compliance, should there be any, were not overlooked, either by the specialists such as those commissioned by the EBRD, or by the Panel – and certainly not by the company.

It was also during the Panel-only discussions that the conviction grew that while 'compliance' was the imperative behind our coming together, any serious look at the needs of Armenia, the history of extractive industry, and what might be termed a culture of mistrust, would underscore the need for Lydian to go 'beyond compliance', to embrace an effectiveness-oriented approach to defining and implementing a model for Responsible Mining.

It is with this in mind that the Panel has approached the preparation of this first report. And before turning to it, the point must be registered that the activities covered relate to the first phase of the project, before any mining has been undertaken.

This is important to the Panel, and, we believe, to Armenia. For example, one critic of the Amulsar project wrote to us stating as fact that the mining operations relied on toxins which were *causing* illness in the communities around the mine, and that mining should be stopped at once. We take such things very seriously, but in this instance, we had to note that as no mining had begun the charge was baseless. The charge laid by that activist implies a limited awareness amongst some civil society groups about the project, and a seeming lack of confidence in regulatory agencies leading to a level of suspicion that makes them unwilling to engage.

We were struck by the fact that, in addition to the work of the Panel, the Amulsar project has been and continues to be subject to a level of scrutiny seemingly without precedent in Armenia, because of the fact that at various times a significant proportion of funding has come from international financial institutions, the International Finance Corporation (IFC) and the EBRD. Accessing this funding has required, for example, that the project be subject to a far more rigorous process for assessing and consulting about the project's environmental and social impacts than would normally be the case in Armenia, and made it subject to the IFC's rules for an assessment to be carried out to confirm the existence of broad community support prior to the commencement of construction. In addition, the project lenders require regular in-depth audits of the environmental and social performance and management systems of the project. During 2017, the company further took the unusual step of publishing a pre-production sustainability report⁴ and also began the process of seeking pre-certification of its systems for compliance with the Cyanide Code from the International Cyanide Management Institute (a process which it successfully completed in January 2018).

We should make clear that we have periodically during the past year raised issues with Lydian's management, either where they consulted us or where we felt that particular points needed to be addressed. Thus, for example, we formally wrote to Lydian management following our September visit to express concern that the dust issue in Gndevaz needed urgent attention and suggesting a renewed focus on tourism issues in Jermuk.

⁴ See http://www.lydianarmenia.am/images/2017/report_eng_electronic_version.pdf (English), http://www.lydianarmenia.am/images/2017/report_arm_electronic_version.pdf (Armenian).

Box 1: Lydian's 2016 Sustainability Report

In August 2017, Lydian published its first sustainability report, detailing its activities in the environmental, social and governance areas during the year 2016. Sustainability reports are produced by companies worldwide with the intention of taking stock of, communicating and improving their sustainability performance.

In the Panel's view, considering that Lydian had only just broken ground on the construction of the mine, it is a positive signal of the company's intentions and mindset that it produced a sustainability report at such an early stage of the project. The report also contains clear acknowledgements of where things could have been done differently or better. As the mine enters production and sustainability-related activities increase, Lydian should look to comply, in its future reporting, with the Global Reporting Initiative (GRI), a global standard that produces internationally used best-practice guidelines for sustainability reporting and which is intended to aid comparability between different companies operating in the same sector and to prevent companies from merely highlighting their strong points.

A difficult context

As noted elsewhere in the report, in addition to local stakeholder concerns, opposition to the Amulsar project by some national and international groups has been persistent. Some analysts the Panel has consulted attribute this to genuine concerns about the impact of mining in Armenia based on the poor social and environmental reputation of the industry. Indeed, during our visits to both Yerevan and the communities around the mine site, such as Jermuk and Gndevaz, we encountered ample evidence that mining in Armenia has delivered, among other things, some problematic legacies. In engaging with stakeholders in Yerevan, we heard stories and allegations of corruption in the sector (which we are not in a position to verify or contradict), misgivings about a lack of transparency, and, both through interviews and in print, the perception that the Armenian state lacked the capacity to oversee and review the necessary environmental impact analyses without which mining operations generally, and the Amulsar project in particular, should not have been given the permits needed to commence operations.

People we spoke to also pointed out that the transparent approach that Lydian has pursued coincides with the presence of a new generation of highly educated citizens that is able to hold

companies, international ones in particular, to high standards. The Panel has observed that historically little information has been released by individual mines or the authorities in Armenia about social and environmental impacts. It is worth noting that this has served to make the context even more difficult for a project like Amulsar – which is avowedly committed to transparency and to making publicly available extensive data on the project – since it makes Lydian more vulnerable to criticism than other companies which may disclose less information.

We noted with interest the efforts made by Lydian, partly in response to the 'climate of mistrust' evident to us all, to encourage and interact with the Armenian implementation of the Extractive Industries Transparency Initiative (EITI), including serving on four working groups formed by the Multi-Stakeholder Group (MSG) which governs the Armenian EITI. Lydian is one of four companies on the MSG, civil society has five representatives and the government six. The introduction of the EITI has the potential to be an important check against corruption as it will give citizens detailed information about mining companies' tax payments, beneficial ownership of mining companies, how mining licences are allocated and, to a lesser extent, how the reve-

nues are spent. The Panel welcomed opportunities, during both our visits to Yerevan, to meet with the MSG, which is powered by very committed people with the sustainable future of Armenia at heart.

The corporate commitment

Before turning to how Lydian has performed in this first phase of operations, and dealt with key issues, from dust to disclosure, from cyanide management to community development, and much more besides, it is worth taking a look at how the company has embraced a culture of compliance, registering commitments made and progress delivered, engagement with IFC and EBRD complaint processes, and, of course, responding to some grievances coming from nearby communities. During our second visit, for example, the Panel had the opportunity to interrogate the company's ongoing Commitments Register, which tracks implementation of around 500 sustainability-related commitments arising out of the project's EIA and ESIA.

We additionally interacted with the EBRD's in-country management and social and environmental specialists to ensure that we are able to learn from each other's work. We have also been mindful of the outcome of a complaint made to the World Bank's Office of the Compliance Advisor/Ombudsman which, whilst largely upholding the company's conduct of the project, urged greater focus on the management of the operation's impacts on the community of Gndevaz given its proximity to the mine's infrastructure; and on means of mitigating any adverse impacts on Jermuk's attractions as a tourist destination.

With Lydian having embraced an impressive number of sustainability commitments, it is worth highlighting that its progress against fulfilling these commitments will be a dynamic process, and that expectations around this should adapt as the mine moves from one phase to another. In other words, we and Lydian's stakeholders should focus now on monitoring the company against those commitments which are relevant to the project's construction phase. As soon as Lydian moves from construction into

production and the project's impacts change, other commitments will be prioritised as they become more relevant; the same may need to happen once wind-down and closure occur.

It is clear, however, that throughout its project lifecycle, Lydian should consider itself not just as a provider of material benefits to Armenia (in the form of jobs and taxes for example), but should also view its own actions and impacts through the lens of acting as a potential catalyst for broader, long-term development. In order to help it achieve this, Lydian should take a systematic and prioritising approach to, for example, its work with communities and around health issues, to maximise long-term benefits for the country and the mine's stakeholders. This may also help the company in some of those 'grey areas' of responsibility (for example on the management of the Jermuk National Park or in longer-term social investment – see sections 2.4 and 2.6) to better define where its role as a company stops and where the responsibility of others, such as the Armenian state or civil society, begins.

Stakeholder engagement

We have established our own contacts with stakeholders of the project, including with representatives from communities around Amulsar, civil society, government, academics, international institutions, labour organisations, investors and the private sector. Appendix 3 contains details of the outreach undertaken by the Panel. Although Lydian initially facilitated a number of introductions, latterly most contacts have been undertaken independently. This engagement has provided the Panel with an invaluable range of perspectives on the extent to which Lydian is fulfilling its commitments to best international practice in Responsible Mining. Regrettably, a few stakeholders declined to engage with the Panel but we remain open to weighing all perspectives and the invitation for dialogue stands.

Aside from our own engagement, the Panel has on various occasions discussed Lydian's approach to engagement with representatives from local communities, media and civil society organisations.

The Panel has witnessed that, at times, the difficulty of constructive engagement with some stakeholders has caused a certain defensiveness on the company's part. By and large, however, the Panel feels that Lydian has remained open to engagement. The company's relations with local communities, for example, largely appear to be constructive, with significant resources dedicated to on-the-ground engagement teams and regular opportunities for feedback via community members on the Community Liaison Committees (CLCs). Similarly, the company's willingness to engage with critics of its approach to acid rock drainage (for example, in responding substantively to their critiques through commissioning additional expert studies and being willing to engage with critics under the government's chairmanship) struck us as positive. Lydian may wish, in its ongoing engagement, to take this further in terms of forming partnerships with credible Armenian institutions on knowledge transfer in other specific areas of the project, since this may help further to provide a platform for informed and constructive discussions on important topics such as impact assessments and their methodologies, etc.

As noted above, 2018 will see a transition for Amulsar from construction to early-phase production. As a result, priorities around stakeholder

engagement are likely to change as the impacts and benefits associated with a producing mine (including different levels of employment and tax payments) may change the texture of relationships and bring in a new set of stakeholders with which the company must engage. And, of course, the experience of production, rather than preparation or planning, might reveal unexpected consequences or, indeed, validation of expectations. The importance of stakeholder engagement will thus be inescapable.

The Panel hopes that Lydian will retain its high level of transparency and engagement and will not close its mind to critics. As later sections in this report emphasise, the Panel strongly entertains a further hope that company and critics might examine the possibilities for such things as participatory monitoring of various environmental impacts in this new phase of the Amulsar project.



Box 2: The Panel's engagement with civil society regarding the project

During our work, we have repeatedly engaged with civil society representatives who are opposed to or have reservations about the Amulsar project in order to better understand their concerns. Amongst others, the Panel has spoken with representatives from the Armenian environmental NGOs Ecolur and EcoRight, and from the international NGO Bankwatch. In our conversations with Ecolur, for example, we learned of the depth of some NGOs' concerns about potential adverse impacts of the project on water resources in the region, including the Kechut Reservoir and Lake Sevan, and about the planned use of cyanide in the mining process at Amulsar.

The Panel considers this type of engagement important and takes such concerns very seriously. We are actively looking into the concerns raised by NGOs including Ecolur, and are committed to holding Lydian to a high standard of social and environmental performance. Indeed, dialogue with stakeholders who have reservations about the Amulsar project is key for us to fulfil our mandate of undertaking objective, independent scrutiny of Lydian, and we will be monitoring the company to ensure that it takes all valid concerns on board and that it has put the appropriate management and mitigation plans in place.

General Recommendations

We see Lydian's corporate commitments being reinforced by several tools that we believe the company should employ as it transitions from construction to production. These include:

■ Partnerships with academic and other institutions to promote public understanding of the concept of Responsible Mining:

Lydian should adopt a partnership approach with academic and technical institutions in order to improve public understanding about what should constitute the legitimate expectations of the mining sector and what 'international standards' and Responsible Mining mean in practice. This might involve work with international donor institutions so as to involve fully international experts alongside their Armenian equivalents, perhaps in a roundtable format. This will help to build the capacity of Armenian citizens anxious to scrutinise projects in the country in an informed, independent, and fair way.

■ The establishment of participatory monitoring programmes to strengthen public confidence:

We suggest that the company and its stakeholders consider agreeing on a process by which stakeholders agree criteria or indicators by which it can be shown if specific environmental concerns are valid, or not. This could be applied, for example, to specific areas of sensitivity such as ARD or the impact of cyanide. For example, when Lydian states that its ARD management plan means there will be no acidic discharge, and if concerned citizens agree that such an approach would theoretically alleviate their concerns, it should be possible to develop a participatory monitoring approach to determine if such discharge takes place, or not. This should then provide a platform for the company to establish, prior or close to commencing production, participatory monitoring programmes with local community representatives or other appropriate stakeholders on areas of concern.

■ The company should consider publicly reporting on progress in implementing its Commitments Register:

As a significant demonstration of transparency and accountability, Lydian could consider making its internal Commitments Register public. This would allow stakeholders to hold the company accountable for commitments made across the mine lifecycle. It would also show the number of commitments already implemented. Making the Commitments Register public (and periodically reporting on progress) would also help to clarify what can be expected from the company and to minimise the spread of disinformation.



2. Observations and Recommendations on Thematic Issues

The following sections focus on specific aspects of the project, in each case providing some analysis of the issues raised by stakeholders or which the Panel has seen as worthy of scrutiny, and concluding with one or more recommendations.

2.1. WATER AND ACID ROCK DRAINAGE

This section considers the Amulsar project's possible impacts on local water resources and Lydian's mitigation plans in this area, in particular with regard to the risk of acid rock drainage (ARD)⁵.

Contextual comment

Stakeholder concerns around the Amulsar project's potential impacts on water have been a key element of the Panel's work and discussions. The issue is clearly and rightly an abiding concern amongst stakeholders, surfacing during many of our meetings in Armenia, including those with some residents of communities local to the Amulsar project and with civil society representatives. It is critical that Lydian effectively and successfully identifies, prevents, mitigates or manages any water impacts.

A primary concern raised during the course of the year appears to be that ARD resulting from the mining process will flow into the groundwater, impacting crucial local and national water resources. For some critics of the project, the sensitivity of the location in terms of water resources means that the project is of significant concern and considered to be too high-risk.

From the beginning, it has been clear to the Panel that the areas adjacent to the mine are of strategic importance to Armenia. For example, the nearby town of Jermuk is home to renowned spa waters, around which much of its tourism industry – a core development priority of Jermuk and the Vayots Dzor region – revolves (see section 2.6 for more details). Nearby are the headwaters of the rivers Arpa, Darb and Vorotan. Further afield is Lake Sevan, the region's iconic largest freshwater source. The Panel visited both these areas, as well as a number of the local reservoirs and water tunnels.

The importance of, and pride in, these local and national water resources underscores much of the concern expressed by stakeholders about the project's potential negative impacts. In the Panel's experience, it is not unusual, nor surprising, to see stakeholders express concerns about how a mining project will interact with the local and broader environment, particularly in terms of water and biodiversity. In the case of Amulsar, it is natural, for example, that local stakeholders would be cautious when faced with having a mine built in proximity to the health of Jermuk. We understand, however, that the spa water is drawn from a different aquifer from that used by the mine, and so it would seem to be highly unlikely for the mine to have an impact on the spa water. Nonetheless, stakeholder concerns have been exacerbated by media accounts alleging that the mine will make Jermuk's famous water

⁵ Acid rock drainage is the outflow of acidic water from metal mines. It can be created when sulphide minerals are exposed to air and water which, through a natural chemical reaction, produce sulphuric acid (see box 4 below for further information).

springs disappear. While many people, particularly in Jermuk, understand that these are among many assertions, such stories create anxieties and all of them must be addressed. Responsible Mining demands responsibility, and veracity, from mining companies and critics alike.

There are many cases where mining is done responsibly and concerns such as these have been allayed once a mine is producing and, for example, local rivers are not impacted. Nonetheless, given instances elsewhere where the outcome has not been so positive, the Panel believes such concerns at Amulsar, as elsewhere, should be taken seriously; and it has endeavoured to thoroughly examine these issues, as well as Lydian's responses. Below are more in-depth discussions of particular stakeholder concerns regarding water which were raised with us, a description of Lydian's approach, and our evaluation of the issues raised.

Debate around the granting of the Amulsar license with regard to water resources

Amongst some stakeholders, there is a lingering perception that the Armenian government did not prioritise protection of the country's water resources in approving the construction of the mine. From what we understand, however, the mine design for the Amulsar project was revised a number of times after 2009 due to a series of legislative changes apparently motivated by the protection of Lake Sevan. For example, the government of Armenia adopted a decree that expanded the area of the Immediate Impact Zone of Lake Sevan, where mineral processing is not allowed. As a result, the Amulsar project design had to be changed on multiple occasions over a period of around five years, and remains subject to limitations. The Panel also understands that the Expert Commission on Lake Sevan, which was established and is led by the National Academy of Sciences of the Republic of Armenia, approved the project's most recent design, suggesting they were reassured in terms of the project's prevention and mitigation measures.

Questions regarding Lydian's ESIA reporting on water and ARD

Some stakeholders have expressed concerns that Lydian's ESIA has gaps pertaining to its assessment of the potential water impacts. The Panel has therefore examined the project's ESIA, and a Panel member, an environmental professional with extensive experience in environmental standards, met with one of the ESIA's authors Dave Brignall (Regional Director of the international consultancy Wardell Armstrong) to better understand the history and process of the environmental and social impact assessments undertaken for Amulsar.

It appears that, in some cases, stakeholders are basing their concerns about potential water impacts on earlier iterations of the EIA, which evaluated elements of previous project designs that no longer apply to the current design. This is thought to be particularly the case in terms of concerns regarding impacts on local river catchments, because of project changes implemented during later stages of the design and approvals processes. An ongoing lawsuit was brought against the government by some local residents and civil society members. This alleged that the Amulsar mining license was illegal, and refers to the project's potential to produce ARD and its impact on water sources – however, the lawsuit was, we understand, based on an outdated version of the EIA.

Other concerns relate to the charge of ARD being poorly addressed in the ESIA. Upon our evaluation of the relevant sections, the Panel has considered Lydian's ESIA to be an example of best industry practice, which includes extensive description, analysis and modelling. In some cases, the concerns have perhaps arisen from a focus solely on the ESIA document, rather than also taking into account the detailed impact management measures contained in Lydian's Environmental Monitoring Plan and Action Plans⁶, which have been designed in response to the ESIA's findings.

⁶ These are part of Lydian's ESIA, which is available at: <http://www.lydianarmenia.am/index.php?m=publications&p=99>.

The Panel does note, however, that the complex geology of Armenia underscores the need for constant attention to water issues throughout the life of the Amulsar project and we would expect this to be enforced under Armenian legislation.

Concerns that Lydian's water management and ARD management plans are not sufficient

In response to the findings of the ESIA, Lydian developed a series of management plans, set out in the Environmental and Social Management Plan, which extensively address the project's environmental and social risks and impacts. Amongst other things, these outline how the project will meet its 37 water-related commitments which arose from the ESIA, and include the ARD Management Plan; the Surface Water Management Plan; and the Preliminary Mine Reclamation, Closure and Rehabilitation Plan. These management plans have been developed in line with the requirements of Armenian legislation, as well as in line with international best practice, particularly IFC Performance Standards (especially Performance Standard 3, Resource Efficiency and Pollution Prevention) and EBRD Performance Requirements – both of which have strict provisions for ensuring that water resources are protected from significant negative project impacts.

Further confidence is offered by the fact that Lydian is regularly audited in line with these standards by an independently appointed Independent Environmental and Social Consultant (IESC; sometimes referred to as an 'independent engineer') to ensure that its management plans and implementation measures regarding water comply with these high standards.

Nonetheless, some stakeholders continue to express concerns around Lydian's management plans, in particular with regard to its management of ARD (see boxes 4 and 5). Given that the issue remains a prevalent concern for many local and other stakeholders, the Panel has undertaken further investigation – including by receiving a presentation from Larry Breckenridge on the technology behind, and robustness of, Lydian's mitigation measures, which was later augmented by a further detailed

interrogation of Mr Breckenridge. It is important to note that Mr Breckenridge's status as a 'Qualified Person' means that what he writes in Feasibility Reports submitted to the Canadian stock exchanges has to be true to the best of his knowledge – otherwise he would be liable to prosecution. The Qualified Person designation helps hold individuals to account on these kinds of projects, and means that they are required to be completely transparent.

In terms of ARD management specifically at Amulsar, we understand that rocks with a high concentration of sulphides (rocks with high acid-generating potential), the main culprit responsible for ARD generation, appear to be present in around 10% of all lower volcanic barren rock, as opposed to up to 50% at some other mines around the world (we acknowledge that some critics of the Amulsar project do not share this view). This suggests that Amulsar's barren rock storage facility may have significantly lower ARD risk than considered in the ESIA. Samples from Soviet exploration piles indicate that ARD at Amulsar will be a naturally slow and abiotic process, which can be controlled through a three-pronged prevention approach, rather than by active treatment (which produces a large and possibly problematic waste stream). This includes bacterial replacement, where, for example, rock is sprayed with waste milk in order to suppress undesirable bacteria, as some naturally occurring bacteria speed up reactions that generate ARD. The Panel is of the view that *prevention* of ARD generation as Lydian is doing, rather than *treatment*, is key. We also understand that, while already being used at many well-operated mines around the world, the measures Lydian is planning to use are to some extent novel in the Armenian context, where the legacy of some examples of irresponsible mining is an understandable cause of scepticism.

The Panel is glad to note that these very specific and complex engineering issues are also part of Armenian technical attention and evaluation, and that the technologies and processes proposed by Lydian, the latest international best practices, have given a new impetus to the professional discussions of the mining industry in Armenia. In the case of successful

results, they will become the achievements of Armenia in the international mining industry. The Panel recommends that Lydian conducts ongoing testing and analysis, including through participatory water monitoring and other tools, to verify the efficacy of ARD prevention measures. We also advise that Lydian uses all available opportunities, including information sessions, to periodically report the results to representatives of the professional and scientific community, so that learnings from Amulsar can be shared elsewhere in the sector.

The Panel has a certain level of confidence in, and hopes that the company continues to follow, the science behind its ARD management plans. If the scale and mine life of the project were to advance beyond the current mine plan, it would be necessary in the context of any such expansion for a new EIA/ESIA to assess the risks associated with deeper mining, including potentially below the water table, and once again to examine the effectiveness of preventative measures against ARD (these findings would, as before, need to be presented to the Armenian public).

For now, however, we understand that Lydian is carrying out appropriate and full planning for preventing ARD at Amulsar. Further assessments are being made at each relevant stage of the production process, with all of the expertise and knowledge gained to date, and under the scrutiny of the EBRD and other lenders and investors and of the Republic of Armenia, and the independently appointed IESC.

Other hazardous materials

The Panel notes that the ESIA includes evidence of significant baseline testing by Lydian on the presence of other potential hazardous materials in local water resources, including of arsenic, and we are assured that there will be ongoing monitoring and testing by Lydian throughout the project's lifecycle to guard against possible hazards.

The Panel understands that Armenia has no facility for the permanent storage of hazardous wastes. The Panel will engage with Lydian and the government to understand what implications this may have for the Amulsar project and, if there are any, how these will be resolved.

Box 3: Participatory water monitoring

Participatory monitoring is the process of collaboratively collecting and analysing data, and communicating the results, in order to identify and solve problems together. It includes stakeholders in all stages of the process and incorporates methods and indicators that are meaningful to all those concerned. An industrial project's impact on water resources is particularly suitable for participatory monitoring because water is often at risk from development, it is vital for the health and wellbeing of the local population and environment, and water quality is a good indicator of general environmental health. Participatory water monitoring can help build trust and address potential causes of discontent by actively engaging stakeholders, by addressing their concerns in the design and implementation of the monitoring programme, by empowering stakeholders through equipping them with credible information, and by informing solutions that can mitigate or remedy any adverse impacts.

The World Bank's Office of the Compliance Advisor/Ombudsman, which considers complaints brought by civil society groups against capital allocations made by the IFC and the Multilateral Investment Guarantee Agency, has produced a guide⁷ that sets out best-practice principles on how to set up a participatory water monitoring programme. Such a programme must, for example, include an effective means of engaging citizens; a means of governing the process that generates independence, stability, and accountability; and financing mechanisms that are dependable and transparent.

⁷ See <http://www.cao-ombudsman.org/howwework/advisor/documents/watermoneng.pdf>.

Recommendations:

■ Establish a participatory water monitoring framework:

The Panel recommends that Lydian, members of the local community and other stakeholders establish an active and effective participatory water monitoring process. The Panel understands from Lydian that its past attempts to establish such a system failed to gain traction with local stakeholders (see Lydian's 2016 sustainability report⁸). However, given that water clearly continues to be a major stakeholder concern and that there are different perspectives on the project's expected impacts, the Panel believes that active and effective participatory monitoring is an essential tool that Lydian and its critics should use to establish the facts about the project's water impacts (including, for example, whether there is evidence of ARD in any discharge). The Panel would recommend that all parties involved transparently publish the results from their respective tests and their findings. The Panel would also advise that stakeholders agree a process or protocol for what constitutes 'good' and 'bad' results beforehand.

Box 4: ARD – a cautious but positive approach

ARD refers to the common process of sulphide minerals producing acid when they come into contact with water and oxygen, which occurs naturally but is exacerbated by large-scale earth-moving activity, such as that associated with construction projects, quarrying and mining. The water that results from this process has a very low pH and often contains metals such as copper and iron, making it hazardous to aquatic ecosystems if it is not suppressed or contained. ARD is a common issue at mine sites around the world and is particularly associated with copper mining because the most frequently mined ore of copper is itself a sulphide.

The process of ARD and how it can be prevented and treated has been the subject of extensive scientific research, so that the process can be predicted and prevented and/or controlled with the right measures. For example, ARD can be prevented either by storing waste rock underwater or by covering it with non-acid generating rock and soil so that it does not come into contact with, respectively, air and water. In cases where ARD cannot be prevented there are effective treatment methods, such as capturing the water and adding alkaline material such as lime in order to reduce the acidity and precipitate the dissolved metals.

We were assured by Lydian that in its approach to ARD it has had close regard to the guidance produced by the International Network for Acid Prevention (INAP)⁹. INAP is an industry-led group established to support best practice on the prevention and mitigation of ARD through the sharing of best-practice information and experience (for example, through INAP's 2009 'GARD Guide').

⁸ See links in footnote 4.

⁹ See more information on INAP at <http://www.inap.com.au/> and INAP's 'GARD Guide' at http://www.gardguide.com/index.php?title=Main_Page.

Box 5: ARD – the negative view

A vocal opponent of the Amulsar project has been Mr Harout Bronozian, a member of the diaspora based in California. In 2017 he commissioned three reports by environmental consultants (Buka Environmental, Blue Minerals Consultancy and Clear Coast Consulting) criticising Lydian's ESIA and its March 2017 technical report, largely focusing on ARD. In recognition that the issue of ARD is of interest to stakeholders, Lydian commissioned a review of these reports by three international technical advisory firms which were all previously involved in Lydian's ESIA process and the development of its Environmental and Social Management Plan – Golder Associates, Global Resource Engineering and Wardell Armstrong. The review opined that the findings of the initial critical reports were largely invalid and at times based on selective evidence or ignored other project documentation that was in the public domain. In return, Mr Bronozian's consultants issued a further riposte criticising Lydian's review, to which Golder Associates, GRE and Wardell Armstrong responded with technical comments providing further information and clarification.

The Armenian government's Ministry of Nature Protection invited the experts who authored Lydian's technical reports and the critical analyses respectively to a three-day roundtable meeting intended to be held in January 2018. Whilst Lydian accepted the invitation, Mr Bronozian and his consultants announced that they would not participate, and instead submitted another written critique. This, the Panel feels, is regrettable since the Ministry's convening power might have led to greater clarity around the issues in dispute. The Panel remains committed to dialogue, and notes that Lydian has also continued to emphasise the importance of keeping open channels of engagement to discuss such matters of concern.

2.2. CYANIDE

An issue of particular interest to stakeholders, especially some local residents, academics, and environmental organisations, is the planned use of cyanide to separate gold from mined ore and other metals at Amulsar.

We have noted that some critics have asserted that Lydian, in opting to use cyanide, is utilising 'old' technology. We do not lightly dismiss such assertions, nor do we disparage 'old' or give undue virtue to 'new', but we do, on balance, see merit in Lydian's overall approach.

Cyanide is used in a range of industrial processes, including the production of plastics, adhesives and cosmetics. Gold and silver mining only absorbs 6% of the 1.1 million tonnes of hydrogen cyanide manufactured annually by the chemicals industry. Over 90% of global gold production from formal mines makes use of cyanidation.

We understand that the cyanide for use at Amulsar will be delivered as dry sodium cyanide in the form of pellets and in containers designed to withstand high-impact collisions, thereby enhancing safety during transport. This is no small matter since most cyanide-related incidents occur during transportation, not production or mine uses, and increasingly strict rules for transporting cyanide are being made mandatory around the world. Indeed, the International Cyanide Management Code (see below) applies not only to miners but also to cyanide transporters. In order to comply with the Cyanide Code, Lydian will need to source its cyanide from manufacturers and transport companies similarly certified under the Code.

The cyanide pellets will then be dissolved to form a dilute solution for use in the project's heap leach facility. In the heap leaching process that Lydian will use, the cyanide is continuously recycled through a closed circuit with no discharge – critically, this method does not require the construction of a tailings dam to store waste material. Instead, the

cyanide is indefinitely recirculated within the heap leach facility and precious metals recovery plant. Cyanide levels decline over time due to natural degradation from exposure to air and sunlight and due to molecular interaction with the minerals, which necessitates continual addition of cyanide to maintain the necessary concentration levels. The removal of the need for a tailings dam is a significant advantage of the processing model selected by Lydian because it removes what at some other mines represents a major hazard. It is worth emphasising the closed-circuit use of water as large volumes of 'new' water will not be needed. We understand that groundwater will be protected by a multi-layered lining under the heap leach facility, which includes a plastic liner layer and low-permeability clay and which will undergo certified third-party testing once constructed. It will also include an underdrain system that connects to a monitoring sump wherein water quality is continuously monitored for the presence of cyanide.

While cyanide breaks down rapidly upon exposure to UV light and is not a cumulative poison, it can be fatal to humans and animals, so its use is strongly regulated throughout the world. A frequent concern voiced by stakeholders is the risk of contamination of rivers and other water sources.

The Panel takes some comfort from the efficacy of preventive measures and notes that cyanide rapidly degrades, but we remind everyone, and Lydian in particular, that cyanide is dangerous and must be used in conjunction with appropriate safeguards.

Commonly-employed mitigation measures to reduce the risk of negative effects on human health and the environment include minimising the amount of cyanide used, designing measures to protect surface and groundwater, and preventing spills. An additional safeguard which is about to be introduced will require the addition of a vivid dye so as to make any spill clearly visible.

Best practice in the safe use of cyanide has been codified in the International Cyanide Management Code (see box 6 below), a programme through

which companies have their operations' cyanide management independently audited and certified. Lydian achieved pre-operational certification for Amulsar under the Cyanide Code in January 2018 – it is the first project in Armenia to do so and the first anywhere since revisions to the Code, including the introduction of more stringent auditor guidance protocols, were made in 2016.

It is worth noting that some critics have asserted that as a 'new' company, Lydian lacks the experience to handle something as toxic as cyanide. This does not seem to be a well-founded concern. Quite apart from the fact that the directors and senior executives of the company collectively have decades of international experience in modern mining, the Panel notes that this Lydian team has achieved something very significant through stringent pre-operational certification under the Cyanide Code. In conjunction with its publicly available Cyanide Management Plan, it shows a strong commitment to international best practice, something more Armenians should be enabled to be aware of.

The Panel welcomes the fact that the company has pro-actively held a number of briefings for local people on cyanide issues, as required by Principle 9 of the Cyanide Code. We are not aware, however, of the extent to which those who attended were reassured or content with the information shared.

Nevertheless, the Panel recognises that some stakeholders continue to express concerns about cyanide use and possible consequences for human health and local agriculture, in particular in relation to the Kechut Reservoir and Lake Sevan. In the Panel's view, Lydian is taking the right early steps to ensure its use of cyanide can occur without adverse impacts to local people or the environment. The

company should, at the same time, recognise the reasons for concern about cyanide and give a high priority to sharing information about its performance in handling it, both locally and nationally.

We note that Lydian is committed to testing locally produced apricots and other fruit from the orchards surrounding the Amulsar operations in order to provide growers with information to combat any attempt at misinformation about their produce. We understand too that Lydian has also maintained a small number of mature apricot trees close to the heap leach facility where, again, produce will be tested. We believe that there might be advantage in making the results subject to verification through some form of participatory monitoring, perhaps involving supervision by an academic institution.

The Panel has been impressed by the fact that academic institutions in Armenia have begun to heighten their engagement with the broad issue of Responsible Mining, and the particular interest in the use of cyanide in such mining. This should be encouraged by Lydian and by all stakeholders – Lydian could, for example, offer to present guest lectures at such institutions on the use of cyanide at Amulsar and the project's management of it. In this way, the capacity of Armenians to participate fully in the modernisation and responsible development of their country's gold mining industry will be strengthened, in the interests of all.

The Panel understands that Armenia has no facility for the permanent storage of hazardous wastes. The Panel will engage with Lydian and the government to understand what implications this may have for the Amulsar project and, if there are any, how these will be resolved.

Recommendations:

Lydian should transparently communicate its approach to cyanide management:

Given the importance of stakeholder concerns about cyanide, Lydian should continue to prioritise the clear and transparent communication of information related to the company's cyanide management. This could be

done through ongoing information sessions in the local communities (as required under the Cyanide Code) and with national stakeholders in Yerevan, and through public reporting on the company's performance and audit results under the Cyanide Code. Lydian should ensure its community briefings are followed up by analysis of the extent to which the information is considered either comprehensible or reassuring. It seems to us that these objectives might be more fully achieved if the company and civil society were to proceed with a participatory monitoring approach around verifying that no cyanide contamination occurs – which we have advocated elsewhere in this report.

Box 6: The International Cyanide Management Code

The International Cyanide Management Code for the Manufacture, Transport, and Use of Cyanide in the Production of Gold, commonly known as the Cyanide Code, is a voluntary industry programme for gold and silver mining companies and cyanide producers and transport companies aimed at improving the consistency of cyanide management practices in the mining industry so as to protect human health and the environment.

The Cyanide Code was principally developed in response to the Baia Mare cyanide spill in Romania, when the United Nations Environment Programme (UNEP) and the International Council on Metals and the Environment (now the International Council on Mining and Metals) convened a workshop with participants from governments, environmental organisations and other NGOs, and gold and cyanide producers. The workshop resulted in the creation of a multi-stakeholder steering committee to oversee the development of the Code, which was finalised in 2002. The following year, the International Cyanide Management Institute (ICMI) was established to oversee the Code's implementation and verification.

The Cyanide Code covers the production, transport, storage and use of cyanide, the decommissioning of cyanide facilities, and also includes requirements related to financial assurance, accident prevention, emergency response, training, public reporting, stakeholder involvement and verification procedures. As of the end of 2017, 47 mining companies worldwide were signatories to the Code, covering more than 120 mines and over half of newly-mined formal-sector global gold production by cyanidation.

Companies that adopt the Code commit to implementing in their operations the good practice principles and standards it sets out, and must have their implementation audited by independent third-party technical experts (that meet ICMI criteria) in order to demonstrate ongoing compliance. The first such audit must take place within three years of a company signing up to the Code, with audits to ensure continuing compliance conducted every three years. Operations that meet the Code's requirements are certified, and audit results are made public to inform stakeholders of the status of cyanide management practices at the certified operation. It should be noted that the Code is subject to a Dispute Resolution Mechanism which enables stakeholders to challenge an audit or certification finding. A summary audit report has to be published on the website of the relevant company.

A company that is not yet operating but is advanced in its planning can request pre-operational conditional certification, for which an independent auditor reviews the company's planning and proposed operating procedures. If the company is found to be in full compliance it will be certified conditionally until the first operational audit, which must then be undertaken within a year of the first delivery of cyanide at its site.

2.3. DUST

Lydian is well aware of the complaints by local residents about excessive dust levels following the start of construction. Concerns were expressed to the Panel by local residents during our visit in September. It was notable that, because of the seeming goodwill towards the company, many people seemed anxious to give Lydian the benefit of the doubt and to pin the blame for the unanticipated surge in dust on contractor companies. Indeed, we understand that Lydian discussed dust impacts and its monitoring and mitigation plans with the community in meetings both prior to and during construction, and the company was praised for the occasions when it had been seen to intervene to correct poor contractor practices.

Nonetheless, we were surprised that the company seems to have initially underestimated the extent of the problem in what was admittedly a dry and windy season. Following our visit, we wrote to the company to underline the extent of local concerns and the danger that the credibility of the company's environmental modelling could be compromised if it was seen to be weak in handling the dust issue. We felt that it should have had the necessary emulsifiers ready for deployment to reduce dust in advance of the problem manifesting itself, but welcome the fact that, following our intervention, the dust issue and acquisition of emulsifiers appears to have been addressed with greater urgency. Although residents told us during our visit that, at that time of year, there was often dust in Gndevaz from the fields, the issue is likely to be an ongoing challenge given the proximity of the mine infrastructure to the village and its surrounding fields and orchards.

Nevertheless, in some cases we judged that complaints about dust were a proxy for addressing other underlying concerns or interests such as the desire to sell more land to Lydian, the need for jobs, concern over claims by apricot buyers that fruit will be less valuable as a result of proximity to the mine, etc. In other words, Lydian should be aware that addressing the dust issue itself will address some, but not all, issues. The engagement team should analyse these underlying interests for which dust is used as a proxy, and should develop strategies for resolving or mitigating each of them.

Lydian now has a Dust Management Programme in place and we are assured that a full range of dust suppression measures will be available as the weather warms up and conditions dry. Also, Lydian now has strong baseline data on the particle size of dust pre-construction, and is conducting ongoing monitoring of the dust as part of its environmental monitoring programme approved by government. The company is currently collecting dust released during construction and captured at 'sticky pads' situated at various points on site and in local communities. These samples are sent to laboratories for analysis. This monitoring, we are assured, will continue during mining operations.

Data on the dust collected is released through quarterly reports which are made public, and this practice must be continued.

Given the pertinence of dust and its immediate impact on the local community, the issue is, like water, a suitable one to address through a participatory monitoring programme. This could measure both the quantity and chemical composition of dust and could involve community stakeholders with particular skills or interest, such as school teachers. Such a group could be trained by an external centre of excellence on data collection and interpretation.

Recommendations:

Dust should be a focus for a possible participatory monitoring initiative in part because the act of regular measurement and monitoring may help all actors to work together in mitigating the problem:

We recommend that Lydian and local stakeholders explore options for a participatory monitoring programme for dust.



2.4. BIODIVERSITY

This section discusses the Amulsar project's management of its impacts on biodiversity and ecosystems and the services they provide, including Lydian's commitment to achieving 'No Net Loss', and potentially 'Net Gain', of biodiversity and its plans to help establish the Jermuk National Park.

Contextual comment

It has been evident from our discussions with stakeholders and from written submissions made to the Panel that some objections to mining, and the Amulsar mine in particular, exist as a matter of *principle*. With the mine permit issued and construction work underway, this now puts Lydian in a difficult position. No matter how committed it may be to Responsible Mining, this is going to be irrelevant to people who are vehemently against mining *per se*, either because of the sensitivity of its location or because they distrust the capacity or integrity of the national institutions tasked with its regulation. For these critics, developing the Amulsar mine responsibly is, of course, not sufficient nor ever will be.

This situation could have been avoided if consultations about the future of the mining sector in the sustainable development of Armenia were adequately addressed by government at the appropriate stage of strategic planning. This is increasingly being done in many countries by the use of the tool of Strategic Environmental Assessment (SEA).

Indeed, this was a key recommendation made by the World Bank to the Armenian government in its 2014 studies 'Sustainable and Strategic Decision Making in Mining' and 'Enhancing Environmental and Social Sustainability of Mining in Armenia'¹⁰. These reports sought to enhance the understanding of environmental and social sustainability principles in the development of Armenia's mining sector.

Indeed, Armenian law has moved along these lines and does make mandatory use of impact assessment. This development, one assisted by the World Bank, is a key underpinning of the Amulsar project.

The World Bank studies recommended that the development of a mining sector SEA as a continuous and inclusive process runs in parallel with the development of formal mining strategies and codes. They suggested that an SEA processes would, amongst other things, help increase attention to environmental priorities, strengthen environmental constituencies, improve dialogue and constructive public involvement, facilitate the understanding of accumulative long-term risks and impacts of mining development from a perspective that is higher than achieved in a simple, project-specific EIA, and would help establish development priorities based on a balanced consideration of economic, social and environmental factors.

Apparently, this has not yet taken place, at least not to the satisfaction of some civil society groups. Consequently, Lydian management and some critics of the Amulsar mine are sometimes talking past each other – seemingly without the possibility of finding common ground.

It is true that the Amulsar EIA and ESIA provided an opportunity for anyone to object to the proposal before permits were granted and construction started, and we believe it is the first time in Armenia that consultation was carried out in line with World Bank/IFC guidelines. In addition, it is always possible that significant new evidence could emerge during the construction and/or operation of the mine that puts in question the ESIA findings or the ability of the mine management to implement the necessary measures to manage negative impacts; an ESIA is not an exact science.

However, there is no evidence that either of these situations has arisen. We therefore interpret our role

¹⁰ See <https://openknowledge.worldbank.org/handle/10986/18958> and <https://openknowledge.worldbank.org/handle/10986/18957>.

as promoting best-practice Responsible Mining at Amulsar as the mine now proceeds.

We encourage an active and positive dialogue amongst all stakeholders and are convinced Lydian does also. For Amulsar, discussions about the principle of whether there should be mining or not is now counterproductive. The Panel does, however, acknowledge that there is merit in the government considering undertaking consultations about the role of mining in the future of Armenia to help shape and guide future mining investments in the country. The appropriate policy assessment process for this would be an SEA.

Biodiversity matters¹¹

The Amulsar mine is situated in a high-value conservation area. However, it lacks the formal protection that many consider that it needs. This means that developing and operating the mine warrants special, more rigorous management measures than normal to ensure its protection.

We have reviewed the way in which biodiversity and ecological issues have been addressed to date by Lydian at Amulsar. Lydian's activities in these areas are framed by compliance with its investors' performance standards, Armenian legislation and Lydian's own policies. Other influences have been the EU's Habitats Directive, the International Council on Mining and Metals and the Business and Biodiversity Offsets Programme, etc. These references represent the international benchmarks of best practice in environmental management.

Documents such as the Amulsar ESIA, Biodiversity Action Plan and Commitments Register served as our main sources of reference together with site visits and discussions with Lydian professionals, local authorities, neighbouring communities, conserva-

tion organisations, as well as NGOs and government representatives in Yerevan and international consultants working on the project.

The biodiversity assessment work was undertaken by a leading international biodiversity consultancy. It, in turn, mobilised specialists (Armenian and international) to undertake more in-depth research. There is clear evidence that Lydian has taken their advice seriously. The Amulsar project has a highly skilled, experienced and dedicated sustainability team to coordinate the implementation of the ESIA conditions and recommendations, and to manage impacts on biodiversity throughout the life of the mine and into post-closure. In short, Amulsar is well-resourced to achieve its biodiversity goals and potentially serve as a model of best international practice.

However, the Panel has received very little comment from stakeholders on the substance of the biodiversity aspects of the project despite general invitations. Some conservation NGOs have decided not to engage in the project – either through the company or government. We consider this to be a lost opportunity for local conservation experts to influence the way the project develops.

As mentioned earlier, a general climate of mistrust of mining prevails in the Armenian conservation NGO community. In part, this may be a legacy of poor historic mining standards and a lack of awareness of what modern Responsible Mining standards can achieve.

Changing perceptions will take time and will be totally dependent on the demonstration of Lydian's effective implementation of the Biodiversity Action Plan by all its personnel.

The Amulsar project is at a critical phase of transition. The good intentions described in the ESIA/Bio-

¹¹ Biodiversity is the measure of the number, variety and variability of living organisms living in a specific area. Biodiversity underpins healthy ecosystems. The components of biodiversity, as defined in the UN Convention on Biological Diversity (1992/3), include ecosystems and habitats, species and communities, and genes and genomes, all of which have social, economic, cultural and scientific importance. It is usual to consider biodiversity at three different levels: genetic, species and ecosystems (e.g. the variety of habitats, communities and ecological processes).

diversity Action Plan during planning and design are increasingly up against competing construction and production targets and deadlines of other business units. Tensions are inevitable, but the extent of environmental auditing by investors that is taking place at Amulsar is ensuring that there is little deviation from the agreed requirements to protect biodiversity values. The mine management team is aware of the risks posed by any slip in performance standards and is going to great lengths to ensure adequate protection of the natural environment of the project area.

During the biodiversity work in the ESIA process, the sensitivities of the region were identified. Two species were identified as of particular significance and have received specific attention:

- ***Potentilla porphyrantha***: listed in the Armenian Red List as 'Critically Endangered' but not yet in the IUCN Red List¹², mainly due to lack of data – although experts suggest it warrants it. Amulsar mountain supports one of only five known subpopulations of this species globally.

- ***Brown bear (Ursos arctos)***: classified as of 'Least Concern' by IUCN but as 'Vulnerable' in the Armenian Red List. The brown bear is targeted for action in this part of Armenia. It is difficult to determine the abundance of bears, but loss of habitat is indicative of a likely decline in the region. The species features in the 'Ecoregion Conservation Plan for the Caucasus' produced by WWF and others in 2012. This emphasises a need to re-establish historical corridors, reduce hunting pressures and prevent further fragmentation of habitat. The occurrence of the brown bear in the project area ensures that it also falls under the 'critical habitat' classification of the EBRD's Performance Requirement 6 criteria (because the species is listed in Annex IV of the EU Habitats Directive). Lydian has taken this as a guide for management objectives, even though Armenia is not an EU member state. The implication of this is that the mitigation measures employed by Lydian will need to be sufficient to ensure a Net Gain for the species (see below for definitions of the goals).



¹² The IUCN Red List is a global inventory of the conservation status of plant and animal species. See <http://www.iucnredlist.org/about>.

Few reliable ecological or biodiversity surveys were undertaken in this part of Armenia before the Amulsar ESIA was carried out. Knowledge about the ecology of the region generally, and the two species mentioned above in particular, has improved considerably because of the ESIA baseline surveys and subsequent research.

Prior to the ESIA, knowledge about the area was mainly anecdotal and survey work was primarily taxonomic and inventory-based. There was little landscape-level work and even a shortage of good maps. It is commendable that Lydian has erred on the side of caution in this situation where there was a lack of data and evidence on the status of important biodiversity issues. There is no doubt that Lydian, through its ESIA studies, has made significant contributions to the understanding of the ecology and biodiversity not just of Amulsar but of Armenia more generally, and thus has already improved the prospects for better conservation.

The ESIA process has thus acted as a catalyst to enhance the capacity of local experts and their institutions. The practice of using international specialists in partnerships alongside counterpart Armenian experts should be continued to the same extent as during the planning process throughout the life of the mine – with a clear exit strategy for expatriate experts. Local capacity development will be an important long-term legacy.

Some unsubstantiated concerns have been expressed that the level of scientific engagement during the ESIA process has now been reduced. This is inevitable to a degree because of the heightened need to collect baseline data during the planning process, but it should continue into more routine monitoring activities, and any reduction in effort raises a concern. There are apparently currently no active contracts to take this work forward, the Biodiversity Monitoring and Evaluation Plan is behind schedule, and some unanswered questions remain (e.g. about the bears' use of the area, the status of migrants and raptors such as the endangered Egyptian vulture (*Neophron percnopterus*),

etc.). Rigorous biodiversity monitoring and evaluation must be a commitment throughout the mine life and into post-mining. High levels of support and resources should be maintained according to the clearly defined strategy in the Biodiversity Action Plan.

The Panel will track the level of commitment to biodiversity monitoring and evaluation at Amulsar as a matter of priority.

The biodiversity goal

Lydian's stated goal is to achieve No Net Loss of biodiversity and priority ecosystem services after closure of the mine. This means that species occurring in the Amulsar area of influence should have the same chances of long-term survival with the project in place as without it, and should have access to similar amounts of suitable habitat as recorded in the baseline situation. No Net Loss is extended to the more ambitious goal of Net Gain (or Net Positive Impact) in some cases. Sufficiently rigorous calculations of this is an ongoing scientific challenge – and this will be no less the case at Amulsar.

These are long-term goals so it is too soon to assess the rigour (of equivalence calculations) and the consequent efficacy of interventions to ensure these outcomes – the prospects for them can be postulated. For now, it is only feasible for the Panel to assess the management systems, strategy and measures considered necessary to progress towards these goals throughout the life of the mine.

In the case of *Potentilla porphyrantha*, ambiguities remain about its status. Some specialists consider that, even without a reintroduction programme, a viable population would remain on Amulsar, so No Net Loss would suffice. To its credit, Lydian has determined to take actions to achieve a Net Gain, whether in numbers of plants or the area occupied by the population, unless there is a significant change of circumstances (i.e. extensive new discoveries of the species are made).

A breeding population of brown bears has been confirmed at Amulsar. This has reversed earlier beliefs that bears were only transiting through the area. Potential loss of habitat, disturbance and barrier threats posed to this population by the mine have been considered. Lydian has also committed to Net Gain for this species.

For now, these are commendable commitments. A point of concern, however, given the long-term nature of these goals, would be the impacts of any major changes in management regime. This could result from company mergers or acquisitions at some point in the future. Given that Lydian's commitments (as outlined in the ESIA) go beyond the legal requirements of its permit, legally the continuation of voluntary measures could seemingly not be enforced by the government in the event of any change in ownership. There is currently no indication of safeguards, either demanded by government or Lydian, that the commitment to these goals will prevail in such an eventuality. We are aware that Lydian is focused on the life of the Amulsar project and post-operations; to this planning could be added a clear statement of the enduring commitment, by all concerned, to the goal of No Net Loss for the biodiversity of the project area.

The mitigation hierarchy

Lydian aims to achieve the above goals by following the widely accepted international best practice known as the *mitigation hierarchy of decision making*. This dictates that avoidance of negative impacts on priority species and critical habitat should take precedence over other management measures wherever feasible – prevention invariably being better and more cost-effective than cure in environmental management.

The practical commitment to the hierarchy is an important area of review for the Panel. Our conclu-

sions so far have been that commitment to avoidance of negative impacts where feasible is evident at Amulsar. For example, the design of road access/site layout, etc. attempted to avoid significant concentrations of *Potentilla porphyrantha* and the Gorayk Important Bird Area (IBA) (which is also part of the Caucasus Biodiversity Hotspot)¹⁴. Other locational, design or technology choices have also resulted in impact avoidance, although they are not necessarily claimed to be motivated primarily by environmental benefits¹⁵. Fortuitously, many *Potentilla porphyrantha* will be avoided as they are outside the infrastructure and mine footprint anyway.

Another example of avoidance is the demarcation of a 'set aside' area for *in situ* protection of *Potentilla porphyrantha*. An area has been set aside to conserve at least 20% of the population on Amulsar and its supporting habitat such as rock outcrops. This will ensure that a source of seeds will remain to facilitate recolonisation after mine-closure. The area will also safeguard other important biodiversity components including the brown bear habitat and various bird species' foraging and roosting areas.

Lydian has agreed that no mining-related activities will take place in this 'set aside' zone. Precise demarcation, levels of community access and scientific monitoring of these areas appear to be work in progress. It has been noted that the 'set aside' area may be reconsidered if mine infrastructure changes require it and scientific evidence emerges that it is not necessary to achieve No Net Loss. We have no knowledge of any such intention but if such a decision were to be made, it could create significant public relations challenges.

Although general information and awareness about biodiversity matters is part of site induction awareness raising, no evidence of more in-depth training (or training materials) on biodiversity values, management commitments and associated responsibilities have yet been seen. Vehicle tracks in

¹⁴ Gorayk is the only IBA known to support a small breeding colony of lesser kestrels in Armenia and is also noted for the presence of other IUCN Red List species, cinereous vulture (also known as the black vulture, monk vulture, or Eurasian black vulture), corncrake, roller – as well as wolf, fox, marten, badger and hare.

¹⁵ Legislation, finance, etc. have played their part.

the set-aside area were reported, suggesting that the value of these areas has not been fully appreciated – although, in fairness, the Panel cannot confirm whether the tracks were generated by Lydian's activities or not.

Some impacts on natural habitat and on up to 30% of *Potentilla porphyrantha* plants in the Amulsar area are unavoidable due to overlap with mine pits. To avoid their destruction, translocation from Amulsar to the botanical garden of the Institute of Botany of the National Academy of Sciences at Lake Sevan has taken place – with much being learnt about this species in the process. These plants are being used to research the distribution, taxonomy, ecological niche, propagation, population modelling, dynamics, and vulnerability to other factors (such as climate change) as a basis for developing an effective restoration programme. This relocation will also provide seed stocks to propagate plants for use in other areas.

The Panel's initial site visits were too soon in the construction process to observe any significant restoration measures although plans and reporting systems are being developed. Topsoil stripping, storage and management to support restoration of natural habitat are evident and appear to be adequate to retain a seed bank for use in progressive restoration. The intention is to create suitable conditions to reinstate *Potentilla porphyrantha* plants to the mine pit areas post-mining. A restoration programme has not been attempted for this species before; the Species Action Plan includes research and experimental work to confirm the best approach for achieving a Net Gain in population size.

This information, and the establishment of the facilities to support them, will have benefits for the advocacy of Caucasian mountain ecosystems and their conservation throughout the region. The challenge is to ensure these initiatives become self-sustaining beyond Lydian's start-up commitments and the immediate needs at Amulsar. Long-term survival of the significant plant species in the area, particularly *Potentilla porphyrantha*, would furthermore be well-served by awareness-raising, nursery facilities and capacity development for monitoring,



etc. in the communities neighbouring the site to complement the capacity development that has already occurred in the botanical research institute and other ecological research facilities.

In addition to restoration planning, Lydian is taking the precautionary approach of committing to establishment of one or more 'offsets' to compensate for the loss and degradation of natural habitat as a result of the Amulsar project.

The need for offsets is not yet clearly established for *Potentilla porphyrantha*. To date the indications are that it will be possible to maintain a viable population of the species on Amulsar mountain throughout mining, albeit with reduced numbers in the short term. Therefore, it is expected to be possible to achieve Net Gain by using other management measures and without the need for an offset. However, because restoration success is uncertain (it may not be possible to create suitable conditions post-mining to propagate sufficient plants or to establish them on newly restored habitat), this situation needs to be monitored.

An offset strategy is currently driven by the status of the brown bear more than *Potentilla porphyrantha*. This is because of the likelihood of significant residual disturbances, as well as barriers to movement and loss of feeding area for up to 10 bears.

Translocation possibilities are limited and complicated by the animals' extensive range requirements.

Lydian has an important role in raising awareness about bear conservation in neighbouring communities – some of whom may see them more as a conflict species and have little interest in their conservation. This again presents Lydian with a challenge and it is necessary to clarify the motives of interested and affected parties.

Jermuk National Park – as an offset

Lydian has chosen to quantify its residual footprint on natural habitat using conservative or precautionary assumptions about levels of habitat loss and degradation within the project-affected area. On this basis, Lydian is committed to implement a natural habitat offset in a part of the proposed Jermuk National Park.

It is believed that offset requirements can be met for brown bears within the proposed national park, though a precautionary approach would suggest the need to identify other offset options in addition to the national park for brown bears to ensure obligations for Net Gain will be adequately met. A Biodiversity Offset Management Plan will confirm the locations of proposed offsets, the specific management actions to be taken and the resources that will be required to ensure that these actions continue beyond Lydian's engagement. The Panel has not yet had access to the Biodiversity Offset Management Plan.

Lydian has signed a memorandum of understanding with the Armenian Ministry of Nature Protection to support the creation of the Jermuk National Park. This is not philanthropy; the creation of a sustainable national park will provide a platform for Lydian's effective offset delivery and attainment of No Net Loss/Net Gain whilst also leaving a legacy for nature conservation and resource-based tourism in the Jermuk area.

Although outside of Lydian's core business, the potential of this venture should not be underestimated. Too often mining leads to deregulation, division, degradation or destruction of areas of high conservation value and (ostensibly) protected areas – such as national parks. In Jermuk's case, Lydian is a potential catalyst in the *establishment* of a new national park¹⁶. The idea has apparently been a long-standing proposal but until recently has not really progressed beyond the concept stage. Mining investments often create new protected areas, but there are no known examples globally where a mine has been a catalyst for creating a new national park. The conservation benefits of the Jermuk National Park are that it would require restoration of areas degraded by other land uses (e.g. overgrazing, forest clearance, etc.) and introduce better control of poaching pressures.

The extent of land potentially available in the proposed national park is 38,867 hectares according to published data. This exceeds the area needed to achieve No Net Loss/Net Gain (habitat diversity notwithstanding). However, a lot of work is still needed to establish credible metrics for potentially achievable offset gains (of sufficient equivalence) and to provide data on habitat types and condition needed for natural habitat loss/gain calculations, etc. – until then predictions of Net Gain/offset possibilities will be tenuous.

By Lydian's own admission, progress in establishing the Jermuk National Park has not been as quick as originally hoped. We understand that the government remains committed to the creation of the park, and we encourage all parties to regard this as a matter of priority.

As a *national* park, the leadership role must remain with the government. Lydian's involvement in the *establishment* of the Jermuk National Park would cease after five years. However, in line with offset requirements it would have to continue to fund these interventions for an appropriate period, currently

¹⁶ National parks are large natural or near-natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible, spiritual, scientific, educational, recreational, and visitor opportunities.

proposed as 25 years. To deliver the required outcomes of the offset strategy, Lydian would retain responsibility for monitoring progress and outcome delivery but the offset strategy would be an integral part of an overall national park management plan, the implementation of which will be the responsibility of a national park board or similar actor.

The Panel would also add caution about pursuing the Jermuk National Park as the *only* offset option. Along with the ownership complications, the Panel's discussions have revealed concerns about the commitment to the long-term management of the area by the full range of stakeholders. The success of the venture would be largely out of Lydian's control once the mine closes, but reputational risks will continue. Lydian may thus wish to consider identifying other offset options in addition to the park given that the long-term management of the area may, at some point, be outside of the company's control.

Ecosystem services¹⁷

The Amulsar project's impact and actions on ecosystem services are well-explained in the ESIA: "the Project will affect land providing a variety of ecosystem services, including some considered to be 'priority services'". A profile of ecosystem services was built up during ESIA interviews and research, but there was apparently some reluctance amongst some communities to prioritise them, preference being for general livelihoods restoration.

However, the Panel has not been able to ascertain whether the 'theory' described in the ESIA has been translated effectively into practical actions and

credible metrics. This may be because it is addressed in other programmes that the Panel did not have time to access or in other work regarding ongoing stakeholder engagement and monitoring.

As metrics relating to ecosystem services are important for establishing the quality, dynamics and dependencies of communities under the baseline conditions (and an important reference for any future claims for compensation against the mine for loss of livelihoods or degradation of ecosystems services), it is an important consideration.

Much of the project area has traditionally been used for grazing livestock and the production of hay, and the project has affected land traditionally used by seasonal and local herders, as well as that used for the collection of mushrooms, herbs and medicinal plants by local communities. The Commitments Register indicates that monitoring of access to high-quality grazing land and hay meadows is ongoing, but also indicates that it was focused on land acquisition procedures and not on the long term. Focus group meetings (in Gndevaz and with herders) were planned "to review the range of ecosystem services" and establish how these have and will change during the mine's life.

Generally, the extent of the commitment to understanding and evaluating the value of ecosystem services to local communities does not appear to have adequately progressed from the planning to the construction and (soon) operational stages. This is needed to help ensure that No Net Lossto human welfare and livelihoods (and wildlife) is calculated, monitored and managed in an objective and scientific way.

¹⁷ *Ecosystems provide services or benefits to humans and all living creatures that are important for their survival and wellbeing. While some ecosystem services contribute directly to human wellbeing, others do so indirectly. For example, livestock production provides direct value to human wellbeing through income generation or providing food for subsistence, whereas grazing lands contribute indirectly, by supporting livestock production. Ecosystem services are generally classified in four types:*

(1) Provisioning services (such as water, food, fuel, etc.); (2) Regulating services (such as flood prevention, climate regulation, disease control); (3) Supporting services (such as soil formation and nutrient recycling); and (4) Cultural services (such as spiritual and recreational benefits).

Degradation or loss of ecosystems may result in a reduction in the services provided and benefits obtained off/from an ecosystem. Mining projects will potentially affect (and be affected by) changes in a variety of ecosystems and the services they provide. They will change or modify ecosystems directly and indirectly. Understanding the interrelationships between humans and ecosystem services is a crucial requirement of ESIA.

The longer-term issues need to be addressed to ensure in a scientific way that ecosystem functions are not being systematically degraded or lost from the Amulsar landscape.

Recommendations:

■ **Lydian should ensure that its monitoring of the mine's ongoing impacts on biodiversity is an ongoing and evolving process:**

The company's biodiversity studies during the ESIA have improved knowledge about the region's ecology. This must be encouraged to continue as the project progresses, also because the ESIA studies, while fit for their immediate purpose, raised further questions about the impact of the mine on the biodiversity of the area, and there is a need for further research and interpretation. Delays in this research (which should be part of the Biodiversity Action Plan) will in turn delay the development of other commitments such as the Biodiversity Monitoring and Evaluation Plan and offset strategy because the research findings will inform their design. In short, the good plans in place need to be more vigorously followed up.

■ **Lydian should consider advocacy with the government of Armenia for it to undertake a Strategic Environmental Assessment (SEA) of the mining sector going forward:**

In the interests of more clearly positioning the mining sector in Armenia's future, it is recommended that advocacy to the government of Armenia encourages it to carry out a mining sector SEA to contribute to the creation of a strategic framework for the future, address concerns about the incremental and accumulative impacts of future mining investments and give Armenians the opportunity (that some clearly seek) to consider the role of the mining sector in Armenia's future.

■ **Lydian should strengthen the implementation of its Biodiversity Monitoring and Evaluation Plan:**

It is necessary to ensure that the ecological monitoring of the Biodiversity Action Plan is being fully and effectively implemented. There seems to be no sign yet of a rigorous Biodiversity Monitoring and Evaluation Plan. Such a plan should set out the details for monitoring biodiversity impacts to ensure and demonstrate that the project's commitments to No Net Loss in natural habitat and Net Gain in critical habitat are being met. Moreover, as part of the Biodiversity Monitoring and Evaluation Plan, the country team should help the local community build capacity to undertake more of a role in monitoring. This is needed to help ensure a long-term commitment and continuation of monitoring beyond the mine closure.

■ **Work on the Jermuk National Park needs to be accelerated and Lydian needs to clarify its ongoing role:**

The Panel understands that the national park memorandum of understanding has yet to be finalised but our engagement with stakeholders suggests that work on the park needs to be ramped up soon. We recommend that Lydian encourages all parties to ensure that this happens, and, along with it, all roles and responsibilities are clearly defined. The importance of the national park proposal should not be underestimated and initial levels of commitment should be honoured.

2.5. HEALTH

The development of health services around potential mining operations cannot just be related to a generic international standard. The ability of the health services to cope with a multitude of possible health problems is not just dependent on the epidemiological profile of the population or the workforce in that region. Service development needs to be based on the reality of the situation and what is available.

The Panel is pleased to see that Lydian has begun to engage in the external monitoring and assessment of the content and quality of health services provided to its own employees and the surrounding communities. It may be that more resources for health services will be available once extraction starts and the mine begins to generate income for the company. However, there are issues that need to be addressed now and it may be too late for some such topics once extraction starts.

Health services, in all dimensions, are like security systems, a necessary component of any mining operation and not 'additional burdens'.

We make our observations from two perspectives: firstly, how best health provision can be improved in the area; and secondly, experience in other countries suggests that, rightly or wrongly, health issues may come to be seen through a lens of suspicion about presumed health impacts if there is not strong and generally understood baseline information against which comparisons can be made. Thus, if a relationship of confidence and trust is to be maintained between the company and surrounding communities, then health is intimately related to perceptions around environmental impacts as well as being a substantive issue in its own right. We are also very aware that the boundaries between the responsibilities of the state and of the company – albeit they should be characterised by cooperation and complementarity where possible – should not become confused.

A systems perspective

We have looked closely at the health services available in the area of operations, delivered by both Lydian and government. Viewing these health services as an integrated system would constitute a positive development. A piecemeal approach to supporting the development of these services by responding to some specific needs only is in no one's interest.

Lydian should consider a different approach, looking at health services as a system with its own resource needs, well-defined standards of processes and procedures that it has to comply with, and a set of outcomes on the basis of which it has to be evaluated.

This systematic approach would ensure higher efficiency in the quality of the management systems, and could include the development and implementation of reliable and valid data collection and monitoring as Lydian appears to be doing.

In addition, the company needs to continue, and improve where possible, its support for and collaboration with the public delivery of health services. The issues at all public facilities go deeper than just facility conditions and insufficient equipment. There is a serious shortage of medical personnel and there are strains on the management of the 'system'. Payments are low and a majority of the services are provided through state funding. Reliance by Lydian on these public services and facilities currently exposes personnel and others to suboptimal healthcare with its own inherent dangers to human health.

Lydian has attempted to help address some of these issues based upon some preliminary detailed recommendations made by the Panel (although we propose that further improvements can be made – see below). For example, the company has invested in equipment, infrastructure and training at the regional hospital in Vayk to establish a trauma centre, for which it received formal recognition from the governor. This will serve as a trauma centre for both the company and for the region.

The development of a systems approach can help improve services by addressing all these issues in a holistic way and not just as one problem to be addressed in isolation. And clearly there are problems.

There is a lack of baseline population health data in the province. It is important that data collected during pre-employment and post-employment medical examinations should undergo epidemiological analysis and be summarised and reported anonymously. Conducting further history and symptom-based surveys is something that should be considered within Lydian's area of operation. Having an extensive baseline would make it possible to compare later findings and determine whether or not there are any future changes that might owe nothing to mining and might be due to other factors. Lydian has noted that its data collection could make a useful contribution to improving national or regional databases, and this we strongly encourage. Eventually, what will be most important for epidemiological surveillance and monitoring is the collection of data on incident (new) morbidity rather than just clinic or hospital visit data which has a large component of prevalent (existing-old) morbidity.

There is a lack of health education in the region, contributing to health issues amongst the popula-

tion. Lydian is making efforts to help address this, including through a programme to educate residents in the four communities local to the project on key health issues, which should help tackle some of these issues and further contribute to a positive systems approach. Seven local nurses and doctors from the four communities were trained on topics including: hypertension (prevention and control); diabetes (prevention and control); healthy sexual behaviour; tuberculosis; healthy lifestyle; child health; women's health; and calcium and healthy bones. These nurses and doctors then cascaded training on these topics to around 680 community members.

Efforts should be made to hasten the testing of the emergency response systems through simulation exercises. The Panel has elsewhere noted the value to Armenia of Lydian's competence in firefighting, and in health emergencies, whatever their cause, Lydian's emergency response capacity is an asset to Armenia.

Finally, mine facility kitchen inspections, while necessary, do not guarantee food safety. It is important to encourage food manager and food handler education and training to control food-related morbidity in the workforce.

Recommendations:

■ **Lydian and the government of Armenia should work to improve health data systems:**

Currently the only level where a reliable data system on services provided may be available is on-site at the Maple Leafs facility. A plan should be developed to capture health-related data from the various components of the operations of existing facilities. The Panel would also welcome collaboration between Lydian and the government to plan for how regional data on health might be improved.

■ **Lydian and the government should cooperate to improve the Jermuk facility:**

This facility is located in one of the important touristic areas of Armenia. It clearly requires systematic upgrading. Considering its importance to both the township and the Lydian operations, independent and government efforts should be encouraged and assisted to ensure quality secondary healthcare is therefore available close to site.

■ **Lydian should share a report on occupational health data with researchers:**

Once the yearly medical examinations are conducted in accordance with government regulations, preparation of a summarised report is necessary; in addition, an 'anonymous' data report should be made available to researchers.

■ **Village health facilities should be developed as a system:**

Although during visits to Gorayk and Saravan it was observed that Lydian is assisting with the provision of various health facilities in the villages, these efforts would be more successful if they were linked to an overall systemic quality improvement approach adopted for these village facilities by the Ministry of Health of Armenia.

■ **Lydian should ensure that contractors provide health insurance to their employees:**

We understand that some of Lydian's contractors have kept workers on short-term contracts in order to avoid having to provide them with health insurance. We recommend that Lydian includes clear conditions in its contracts, and follows up on these, to ensure that workers are adequately insured.

2.6. SOCIAL AND COMMUNITY ISSUES

This section considers the Amulsar project's relationship with its stakeholders and how it communicates with them together with observations on its social performance and community-level relationships.

Trust and attitudes towards the mining sector in Armenia

As noted in the foreword, although mining is a significant contributor to Armenia's balance of payments and tax base, it is associated with some difficult legacies. Moreover, many of the civil society groups or activists with whom the Panel has interacted have told us of their ingrained distrust of mining companies. This is rooted in perceptions of a very poor environmental performance by some existing mines; a belief on the part of some activists that some operations are politically connected and can breach environmental regulations with impunity; and concerns that mining benefits an elite rather than society at large. In relation to Lydian, suspicions appear to be elevated because it is foreign-owned and has not previously built and operated a mine. Furthermore, even those who recognise that Lydian has gone above and beyond standard social and environmental practices couple this with scepticism about whether the company is a long-term holder of the asset and, in the event of a sale of the mine, whether the commitments made in order to secure its license to operate would be sustained under new ownership.

These concerns are compounded, on the part of some sections of civil society, by their perception of an absence of strong regulatory checks and balances. Some civil society groups expressed concerns to us that the relevant government agencies lack the capacity to ensure mining is done responsibly in relation, for example, to assessing environmental impacts or evaluating EIAs.

We are not in a position to evaluate the systemic criticism of existing mining operations nor to provide

an assessment of the strength of the government of Armenia's regulatory capacity. Our perception is, however, that ministers have recently been pursuing a reformist agenda intended to encourage higher environmental standards. In this context, they appear to see Amulsar as a largely positive actor.

In relation to Lydian's credentials to develop a major mining project, we can confirm that its senior managers have, between them, extensive experience of operating mines as well as a commitment to build the experience of credible Armenian managers. Moreover, Armenian stakeholders can take some comfort from the fact that Lydian's shareholders include substantial, reputable and experienced mining investors, such as Resource Capital Funds and Orion Mine Finance, as well as the EBRD. Although Lydian is domiciled in the British crown dependency of Jersey, we understand that this has no adverse implications for the amount of tax paid by the company in Armenia – indeed we were surprised to learn that Lydian is already Armenia's sixteenth biggest taxpayer in advance of going in to production. In our discussions with Lydian's Board of Directors, we were encouraged by the Board's awareness of and commitment to the undertakings spelled out in the EIA. Though the Board gave no indication of any desire to exit the project, or indeed to sell the company, we know that no publicly traded company is immune from takeover. However, it is clear to us, and should be to others, that all of the commitments made in the EIA for the project would remain as requirements to be honoured by any new owner, just as they will be by Lydian.

Against a background of distrust, Lydian has been compelled to take an approach that is characterised by a level of commitment and degree of transparency that, in the Panel's view, goes well beyond normal practice. As indicated previously, examples of this include the fact that its ESIA was carried out to international standards and was subject to extensive disclosure and consultation; this gave rise to around 500 commitments whose implementation is systematically tracked; the EBRD's investment requires regular auditing of the company's performance against social and environmental benchmarks; and

Lydian produced its first sustainability report in 2017, which is fairly unique both for a company of its size and given that the project has not yet gone into production (see box 1, section 1). At a community level the company has also tried to establish a community water participatory monitoring project to build confidence amongst local residents. Additionally, the company is required to be transparent about its shareholders, financial results and payments to governments through its Toronto Stock Exchange listing.

Lydian has acknowledged that pressure from civil society groups has obliged it to review its policies and practices and to increase rigour where needed. It

appears to us to have taken feedback from critics seriously and made efforts to commission additional research to verify whether particular criticisms (especially those of an environmental nature) have a scientific foundation. This was most clearly demonstrated by its response to the concerns raised towards the end of 2017 about its approach to the risk of ARD. Another option for Lydian is to put out to those that have legitimate concerns an open invitation for guidance on what the company needs to demonstrate in order to break down the barrier of distrust. Such a conversation might be constructive as it encourages parties to think in terms of solutions rather than to only focus on problems.

Box 7: Scrutiny and performance monitoring

In addition to the Panel's high-level scrutiny of Lydian's governance and performance, there are additional parties that monitor specific aspects of the Amulsar project. As an investee company of the EBRD (and previously the IFC), Lydian has to conform with specific performance standards that cover environmental and social domains, in particular the EBRD's ten Performance Requirements¹⁹. By way of example, Performance Requirement 2 on labour and working conditions requires companies, among other things, to comply with the principles and standards of the ILO conventions and to provide an effective grievance mechanism for workers to raise concerns.

In order to monitor Lydian's performance in relation to its environmental and social commitments, the EBRD and other major shareholders have retained an Independent Environmental and Social Consultant which conducts ongoing audits of Lydian's operations, including regular site visits.

What international best practices mean for Armenia

Nevertheless, it is clear to us that despite its efforts to win trust and to build bridges to critics, some civil society organisations remain sceptical about Lydian's intentions. One of the reasons might be that the company (and its auditors) talk about following international best practice without clearly explaining what this means in concrete terms. Without such an explanation, using a term like 'best practice' risks becoming just a phrase without any reference

against which a practice can be measured. Hence, as discussed in the foreword, the opportunity for Lydian to articulate what Responsible Mining in Armenia should mean in very practical terms and how this should be distinguished from 'old-style mining'. The company needs to work harder in its communications to make 'international best practices' relevant to Armenia and, where this is justified, to encourage ordinary citizens to see the implementation of such practices as a source of pride.

¹⁹ More information on the EBRD Performance Requirements is available at:

<http://www.ebrd.com/cs/Satellite?c=Content&cid=1395256635868&d=Mobile&pagename=EBRD%2FContent%2FContentLayout>.

The company is, after all, one of Armenia's largest investors and it has attracted world-class experts to apply innovative and well-respected practices; it has attracted EBRD funding, it supports Armenia in becoming part of the select leadership group of EITI countries, and it provides good-quality job opportunities to Armenian youth.

In particular, we were struck by some instances of good practice of which Armenian citizens may not be aware, but which Lydian and responsible miners worldwide consider to be 'normal practice'. These include:

- When Lydian was dissatisfied with the attitude to safety being displayed by some contractor companies during construction, it ordered work to stop (a 'safety shutdown'), during which everyone was subject to intensive training on safety procedures.
- It acquired and deployed a fleet of new water bowser trucks much earlier than anticipated in order to suppress dust in response to complaints by local community members.
- When local apricot growers revealed that some wholesale buyers were trying to discount the price they were willing to pay for Gndevaz's famous apricots because of perceptions that they might be tainted by mining, Lydian initiated a programme of testing locally grown fruit and vegetables to show that they do not contain heavy metals.
- In order to check that local residents are not subjected to a differential local rate of inflation arising out of a reduction in land given over to agriculture and the influx of more people to the locality, Lydian monitors the prices of a number of staple goods and seeks to intervene if it appears that local people may otherwise be disadvantaged.

These are all practical examples that make otherwise somewhat abstract notions of 'international best practice' or 'modern mining' come alive. In this respect, we have noted that Lydian representatives have drawn on media interviews as an opportunity to

be more specific about the company's work, allowing the public to better assess Lydian's approach.

We were told by some civil society actors that in Armenia there is a high degree of distrust of formal institutions, including parts of the traditional media. Lydian has found it difficult to break through this scepticism. Nevertheless, we were told that the company adopted a more pro-active social media programme during 2017.

Whilst its penetration seems to be relatively limited, we would recommend that the company should expand its direct outreach to Armenians both in Armenia and in the diaspora so as to ensure that it can deliver the hard data about its performance directly rather than only through the formal media.

Social performance

It is notable from our own visits to the area around the project and what we were told by local residents, coupled with the outcome of the IFC's 'broad community support' assessment, that the project is recognised by local stakeholders as actively contributing to an increased quality of life. One reason for this would appear to be the company's maintenance of social investment in the four closest communities even during periods when the future of the project was uncertain.

In addition, Lydian's social performance approach appears to us to be remarkably mature for a project in construction. As evidence of this, we would particularly identify that the following key systems are in place: multiple social investment programmes, a livelihoods restoration programme (LRP) for those whose land was impacted by the company's land acquisition programme, a local employment strategy, commitment management, inserting social performance requirements into contractors' contracts, well-functioning community information offices and food basket price monitoring. These and other approaches together constitute a comprehensive approach. Some of these approaches could, of course, be adjusted over time to make them more effective (or to better demonstrate their effective-



ness) but most of the elements of a social performance management system are in place. This is an achievement that deserves to be recognised.

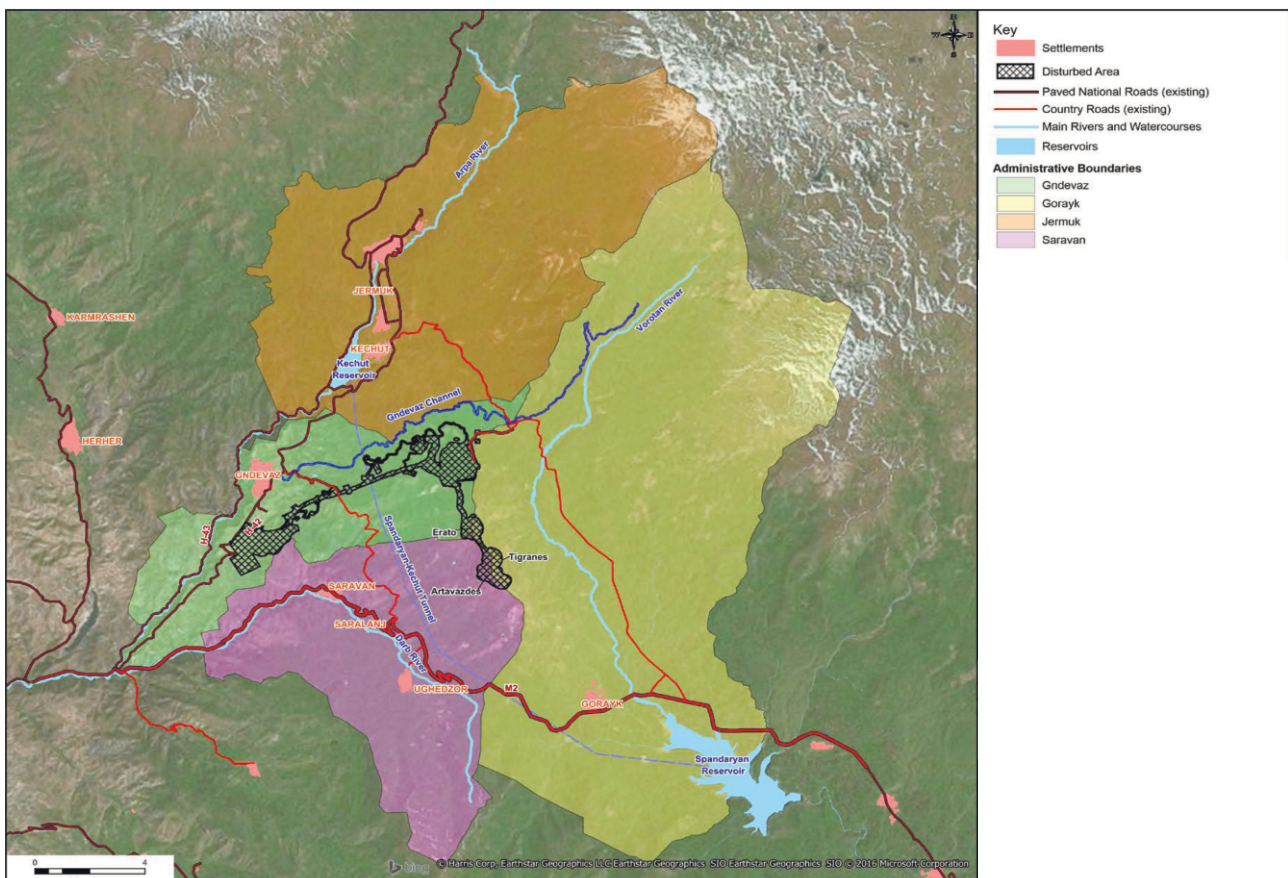
The approach is well-resourced relative to the project's impact with a community engagement/social investment team of around 15, two local recruitment officers and multiple partnerships to implement over 20 livelihoods and social investment programmes.

With regard to sentiment amongst local stakeholders, relations seem to be constructive albeit subject to some unmet expectations in relation to access to

jobs. Local leaders acknowledge that the company has largely followed through on its commitments and has been accessible and transparent about its operations. This is in no small part due to the presence of information offices in each of the four most directly affected communities, staffed with people who come from these communities. The company has indicated that it has provided employment to all people from the nearest and most impacted community (Gndevaz) that met basic employment criteria – albeit the Panel is not in a position to independently verify that this is the case.

There is also evidence that social investment projects in affected communities have enabled local residents to make housing improvements or take a first family vacation. Still, such examples are insufficient for judging the project's developmental impacts until such a time as the company and the communities agree on a broader definition of what constitutes 'success' and the parts that should be played by the company and the communities themselves (see below).

Figure 1: Communities in the vicinity of the Amulsar project (source: Lydian 2016 Sustainability Report)



Local employment and procurement

Employment opportunities for local people at mining projects are generally greatest during the construction phase. Lydian set itself a target of ensuring that at least 30% of all company and contractor staff are drawn from the directly impacted local communities. As of the end of 2017 there were 1,236 employees and contractors, of which 34% came from the target communities.

The company also has a local employment plan in place to support the employability of local people. Training programmes have been put in place to ensure that non-skilled local employees who work with the company have a better chance of obtaining semi-skilled roles when the project moves into production. While the company has met the target in its ESIA, the Independent Environmental and Social Consultant, which conducts periodic audits on behalf of lenders and investors, notes, however, that some contractors have only achieved low levels of local employment. This is a matter of concern. In the Panel's view, at a minimum, the company should commit, and be able to demonstrate, to 100% local employment for non-skilled labour positions and enforce that commitment on its longer-term contractors.

In relation to local procurement, the Lydian Board has recognised the importance of this benefit and has created a new position to support local companies and entrepreneurs in obtaining access to Lydian opportunities. This is a significant step that would be most effective if accompanied by unambiguous and binding language in contracts that support the local procurement approach. Lydian's Local Procurement Plan allows for 'appropriate wording' in tendering documents and contracts, but does not specify what is expected. As a result, a gap exists between the intent of the plan on the one side, and enforcement amongst (sub)contractors of local content requirements on the other. Lydian staff are keenly aware of this challenge but recognise that there may be trade-offs, for example, between the local supply chain objective and safety or quality

targets which may be more easily realisable from contractors using staff with whom they are used to working. Nevertheless, demanding that contractors take a more localised approach and act in line with the intent of the local procurement policy is an example where Lydian can demonstrate what a Responsible Mining approach means in practice.

Social investment and land acquisition

The social investment efforts at Amulsar focus both on directly impacted people (for example those that lost access to their land) and other residents in nearby communities. With regard to directly affected peoples, the company is required to ensure, and to demonstrate, they are at least no worse off as a result of the project given its acquisition of 22 hectares (about 15% of the area previously under cultivation) of apricot orchards. These compensatory programmes are largely focused on livelihood replacement including the restoration of an irrigation channel to restore an area of cultivable land north of the village not used since Soviet times, which has brought 190 hectares of orchards into production. We note that the company is putting in place mechanisms for tracking the welfare of those who sold their land and who may subsequently have spent their compensation unwisely. The livelihood replacement programme implemented by Lydian aims to ensure that people who lost land as a result of the project (and received compensation) are not worse off as a result of the project compared to their situation before the arrival of the project. This is a heavy responsibility for Lydian and all indications show that the company takes this responsibility seriously. Nevertheless, we would encourage the company to continue to demonstrate, on a household level, that families are not negatively impacted, including in the longer term.

With regard to the broader social investment approach, a large number of community stakeholders benefit from projects created in response to requests from local residents, ranging from microcredit programmes to agricultural support to

provision of karate and dance classes. Despite this considerable variety of projects (we understand that there were 24 social investment programmes in 2017 with a further nine aimed at livelihoods restoration), there is no agreed limit to what Lydian will provide or a mechanism by which the community has to make choices. Experience from other projects shows that local ownership for programmes increases when trade-offs need to be made. Thus, there is a risk that Lydian's efforts are 'never enough', no matter how many projects are implemented.

The company is currently adapting its approach to develop, together with communities, a joint vision for the future or agreed definition of 'success.' The aim of this vision is to encourage local people to take ownership of their futures and to leave behind benefits that can be sustained after mine closure. In order to achieve this goal, the role of the company will need to transfer from a provider or implementer to one where the company provides a catalyst to support the community in taking charge of its own destiny. This implies that Lydian has the opportunity to use its presence to provide a 'model' that allows for a departure from a slightly paternalistic approach to one based on partnership. We strongly recommend that the company should persist in its engagement with local people to facilitate them in defining what their vision is for the future of their area and what the success criteria should be for local people. We will want to return to examine progress on finalising a shared community-level vision for the future in next year's report.

Various Armenian stakeholders have pointed out that in addition to ensuring net positive impacts for directly affected local communities, Lydian should take into consideration that in the Armenian context Amulsar is perceived as a national asset and, as such, people all over Armenia feel a strong attachment to the area. This implies, in their view, that Lydian should complement its local social programmes with initiatives designed to benefit national causes. In this respect, Lydian's hands-on support for firefighting efforts in Vayots Dzor province was particularly appreciated since the fires were seen as a national

challenge. We understand too that the Jermuk National Park initiative may have national resonance given Jermuk's iconic status in the country. Lydian will soon become one of the biggest contributors to Armenia's economy and the company needs to adjust its style to reflect this reality.

The impact of local government 'optimisation'

A number of the local government entities around Amulsar appear to be too small for good-quality service provision. This is what we understand has caused central government to motivate the merger of a number of entities including the municipalities of Jermuk and Gndevaz. Nevertheless, as the nearest community to the mine, the residents of Gndevaz had previously enjoyed substantial benefit from land-use fees. These have now been passed to the control of the mayor and council of Jermuk – on which Gndevaz has relatively small representation. We would suggest that although the distribution of benefits is ultimately a matter for elected representatives, the company should be an advocate for ensuring that Gndevaz residents continue to receive a fair share of the revenues – since it was on that basis that they gave their support to the mine and the proximity of the village means that it is most likely to have the greatest exposure, for example, to dust.

Grievance and complaints management

Grievance management is an essential social performance tool for mining operations. It provides the important purpose of addressing issues at an early stage, and before they become more generalised problems or anger escalates. Most companies consider the presence of a considerable number of formally registered grievances as an indication that they have a good early-warning mechanism that allows them to correct unintended project impacts or to address stakeholder concerns. In addition, accountability should be one of the core principles for companies that want to mine in a manner that is responsible and aligned with societal expectations.

In recent years, the so-called 'effectiveness criteria' set out in the United Nations Guiding Principles on Business and Human Rights²⁰ (UNGPs) have become the standard against which to benchmark operational grievance mechanisms. These are recognised for example in the World Gold Council's Conflict-Free Gold Standard²¹. Such a grievance mechanism should provide aggrieved citizens with a route to redress that does not involve costly and drawn-out legal proceedings.

Lydian has a functioning grievance mechanism and the Panel was able to see that it is well-used, albeit we did not see any rating of complainants' satisfaction with the process and outcomes. It is, however, quite basic and no longer fit for purpose as the actual and potential impacts of the operations ramp up. The Panel would, therefore, recommend that it should be updated so as to be more closely aligned with the UNGP's effectiveness criteria. This means ensuring that the mechanism is, and is perceived as, *legitimate, accessible, predictable, equitable, transparent, based on dialogue, rights-compatible and able to lead to continuous learning*. In addition, publicising monthly statistics on grievances and complaints, as well as details of any changes that Lydian has made to avoid repeat grievances would increase public confidence in the procedure. This might, paradoxically, result in an increase in the number of complaints but if it builds trust and provides access to remedies then this would be a defining characteristic of a responsibly run mine and would allow the company to carefully review its approach and determine opportunities for improvement. Thus, we would recommend that Lydian redesigns its grievance procedure at Amulsar in line with the 'effectiveness' criteria, including potentially an independent element in any appeal mechanism.

Tourism

Jermuk is one of Armenia's primary resource-based tourism centres, albeit we were surprised by the relatively small number of visitors received annually. Concerns have been expressed to the Panel about the proximity of the Amulsar mine development to the town and its compatibility with the tourism values of the area. Although some of these concerns may be perceptual rather than real, a mining project and a health spa are nevertheless not automatically regarded as happy neighbours.

Jermuk has been active as a spa for many decades and developed further as a medical centre in the Soviet era. It was also apparently a stopover for some travellers on the Silk Road during the Middle Ages. A spring water bottling enterprise exists in the centre of the town. As noted in section 2.1, we understand that the spa water is drawn from a different aquifer from that used by the mine.

The region's landscape qualities (including mountains, waterfalls, forests and associated wildlife) and relatively undisturbed environment contribute to its attraction. The area is already frequented by hikers and bird watchers and is on local and a few regional holiday tour routes. This sector seemingly has considerable scope for growth. The proposal to develop the Jermuk National Park could prove transformational to the area's touristic attractions – albeit our concerns about the slow pace of implementation are noted in section 2.4.

Some user-oriented facilities also exist (e.g. a cable car and ski run) and Jermuk additionally has a reputation as a venue for international chess tournaments (that Lydian has supported) – an activity of great prestige in Armenian culture.

Yet it must be said that Jermuk has several areas of dereliction and less attractive features. Even close to the prime attractions, such as the main waterfall, deserted and dilapidated buildings and potholed

²⁰ See http://www.ohchr.org/Documents/Publications/GuidingPrinciplesBusinessHR_EN.pdf.

²¹ See [https://www.gold.org/sites/default/files/documents/Conflict Free Gold Standard English.pdf](https://www.gold.org/sites/default/files/documents/Conflict%20Free%20Gold%20Standard%20English.pdf).

roads and pavements, a disused airfield, etc. create a somewhat blighted impression. Indicative of the local socio-economic dynamics, the Jermuk population has declined since the 1980s, standing at 5,230 according to the 2011 census and 7,638 according to data collected by Lydian in 2016.

However, the Jermuk municipality has plans for the revival of the town as a modern health, spa and tourist centre, and Lydian has already done much to contribute to these developments and to reverse the economic decline. In some cases, these have been coincidental spin-off benefits for the tourism sector from the influx of people, rising disposable incomes, procurement from small business, etc. In other cases, contributions to the sector have been more direct, by upgrading some infrastructure (including roads, waste collection, water reticulation) and directly supporting the local authority budget. Recent examples of such support include assisting hospitality workshops for restaurant and hotel staff, annual festivals and events.

The reversal of the fortunes of the tourism sector is, we have to note, a work in progress. A risk to Lydian is that some people may erroneously conclude that any shortcomings are a result of the mine. In fact, the reality is very different and we welcome, for example, the apparent care with which the company

has sought to use only a limited amount of the town's hotel accommodation so as not to crowd out normal visitors. But, amongst the aspects of the town badly needing remediation, is the landfill waste facility. It appears to be little more than a disorganised fly-tipping site. We observed instances of combustion alongside the visual intrusion caused by rubbish spilling from the site. We note too that the Amulsar ESIA indicates existing surface water contamination from the landfill. This is all in contrast to the measures that Lydian has been putting in place to manage its own on-site domestic waste disposal and recycling facilities. The standards we saw employed by Lydian in its own site management and general on-site housekeeping will hopefully influence changes in the broader environment. We encourage Lydian to offer to share these standards with the town and with appropriate departments of the government of Armenia. It may, of course, be that the additional revenues flowing from the mine development might enable the municipality to address the problematic landfill and perhaps create a more sustainable alternative facility. In such circumstances, we are confident that Lydian would have expertise to contribute.

In terms of visual intrusion, the ESIA indicated that views towards Amulsar mountain will be impacted by



the mine and cause significant visual change from some locations close to the mine, mostly due to the open pits, heap leach facility and the barren rock storage facility. Visual intrusion is considered to be limited to a 5-kilometre radius of the mine. This is probably most obvious along the road to Jermuk.

We believe the mine is located far enough away in sufficiently undulating landscape not to be a significant noise or visual detractor for the majority of visitors to Jermuk. We are not sure, however, if the mine will intrude on visitors' experiences in the proposed national park – but the design of trails and road systems in the park area should take account of this. The mining landscape will change, but the photo mock-ups/artist's impressions of the anticipated post-mining landscape profile should allay many fears and be widely distributed.

More than this, however, there is great potential to develop the mine as an additional touristic attraction of the area. Over the past decade UNESCO has designated several post-mining landscapes as World Heritage Sites because of their industrial archaeological interest (e.g. in the UK, Sweden and

Greece). Many operating mines develop sophisticated interpretation/visitor centres to accommodate public visits and explain the history of the gold mining industry, the mines' operations and company management measures. With the support of local experts, for example, some mines produce field books to help visitors understand the geology, culture, history, fauna and flora of the mining area (a good example is Centerra Gold's factsheet²² on its reclamation activities at the Boroo Mine site in Mongolia). This adds value to the investment a mine has already made in carrying out baseline studies for an ESIA, gives people a better understanding of what Responsible Mining can achieve and makes a positive contribution to people's understanding of their environment and the need to conserve it. In the case of Amulsar, for example, this type of engagement could help increase interest in and address any persecution of iconic species such as the brown bear. We support the proposals in the ESIA to establish a gold-themed museum in Jermuk. This might incorporate some archaeological finds from the mine site as well as an explanation of the mining process.

Recommendations:

■ Lydian should work with the Jermuk municipal authority to consider for the mine to augment the attractions of the area as a tourism centre:

We recommend that Lydian should consider the potential to develop Amulsar as an addition to the touristic attractions of Jermuk through, for example, a visitor centre, a field book of local fauna and flora, or support for a gold-themed museum in Jermuk. In light of the finding of the World Bank's Compliance Advisor/Ombudsman that the project's impact on local tourism is a potential area for improvement, Lydian might wish to work with relevant authorities in catalysing a new tourism strategy for the area.

■ Lydian should redesign its grievance mechanism to reflect international best-practice standards:

With respect to grievance management, although the current arrangement seems to attract a reasonable level of public participation, we do not consider Lydian's grievance mechanism as any longer 'fit for purpose'. Thus, we recommend that it be revamped so as to be better aligned with the UN Guiding Principles on Business and Human Rights effectiveness procedure.

²² See https://s3.amazonaws.com/cg-raw/cg/boroo_reclamation_2011.pdf.

■ Lydian should be tougher in enforcing social performance conditions on its contracting companies, especially in relation to local jobs and supply chain opportunities:

We noted concerns about the ability or willingness of (sub)contractors to meet the company's local employment and procurement requirements. We wrote to the company following our visit in September 2017 to express our concern that local people's expectations about jobs should be addressed as fully as possible during the construction phase. Since such conditions should be susceptible to contractual enforcement, we urge the company to follow through more strongly in relation to the enforcement of its desired contractor social performance standards. Indeed, the premium on effective contractor management extends beyond local jobs. The importance of this for Lydian was underlined for us by the fact that the real anger we encountered about dust issues in Gndevaz during one of our visits to the community appears to have been caused by thoughtless behaviour by contracting companies.

■ Lydian should facilitate local communities in a process for defining their vision for their future both during and after the end of mining:

We strongly recommend that the company should persist in its engagement with local people to support them in defining what their vision is for the future of their area and what the success criteria should be for the local community and the mine in working together to support development.

3. Recommendations

This section summarises the key recommendations of the Panel. The first section lists those to Lydian alone, and the second section lists those that apply to Lydian as well as stakeholders of the Amulsar project.

RECOMMENDATIONS TO LYDIAN

GENERAL:

■ Partnerships with academic and other institutions to promote public understanding of the concept of Responsible Mining:

Lydian should adopt a partnership approach with academic and technical institutions in order to improve public understanding about what should constitute the legitimate expectations of the mining sector and what 'international standards' and Responsible Mining mean in practice. This might involve work with international donor institutions so as to involve fully international experts alongside their Armenian equivalents, perhaps in a roundtable format. This will help to build the capacity of Armenian citizens anxious to scrutinise projects in the country in an informed, independent, and fair way.

■ The company should consider publicly reporting on progress in implementing its Commitments Register:

As a significant demonstration of transparency and accountability, Lydian could consider making its internal Commitments Register public. This would allow stakeholders to hold the company accountable for commitments made across the mine lifecycle. It would also show the number of commitments already implemented. Making the Commitments Register public (and periodically reporting on progress) would also help to clarify what can be expected from the company and to minimise the spread of disinformation.

CYANIDE:

■ Lydian should transparently communicate its approach to cyanide management:

Given the importance of stakeholder concerns about cyanide, Lydian should continue to prioritise the clear and transparent communication of information related to the company's cyanide management. This could be done through ongoing information sessions in the local communities (as required under the Cyanide Code) and with national stakeholders in Yerevan, and through public reporting on the company's performance and audit results under the Cyanide Code. Lydian should ensure its community briefings are followed up by analysis of the extent to which the information is considered either comprehensible or reassuring. It seems to us that these objectives might be more fully achieved if the company and civil society were to proceed with a participatory monitoring approach around verifying that no cyanide contamination occurs – which we have advocated elsewhere in this report.

BIODIVERSITY:**■ Lydian should ensure that its monitoring of the mine's ongoing impacts on biodiversity is an ongoing and evolving process:**

The company's biodiversity studies during the ESIA have improved knowledge about the region's ecology. This must be encouraged to continue as the project progresses, also because the ESIA studies, while fit for their immediate purpose, raised further questions about the impact of the mine on the biodiversity of the area, and there is a need for further research and interpretation. Delays in this research (which should be part of the Biodiversity Action Plan) will in turn delay the development of other commitments such as the Biodiversity Monitoring and Evaluation Plan and offset strategy because the research findings will inform their design. In short, the good plans in place need to be more vigorously followed up.

■ Lydian should strengthen the implementation of its Biodiversity Monitoring and Evaluation Plan:

It is necessary to ensure that the ecological monitoring of the Biodiversity Action Plan is being fully and effectively implemented. There seems to be no sign yet of a rigorous Biodiversity Monitoring and Evaluation Plan. Such a plan should set out the details for monitoring biodiversity impacts to ensure and demonstrate that the project's commitments to No Net Loss in natural habitat and Net Gain in critical habitat are being met. Moreover, as part of the Biodiversity Monitoring and Evaluation Plan, the country team should help the local community build capacity to undertake more of a role in monitoring. This is needed to help ensure a long-term commitment and continuation of monitoring beyond the mine closure.

HEALTH:**■ Lydian should share a report on occupational health data with researchers:**

Once the yearly medical examinations are conducted in accordance with government regulations, preparation of a summarised report is necessary; in addition, an 'anonymous' data report should be made available to researchers.

■ Lydian should ensure that contractors provide health insurance to their employees:

We understand that some of Lydian's contractors have kept workers on short-term contracts in order to avoid having to provide them with health insurance. We recommend that Lydian includes clear conditions in its contracts, and follows up on these, to ensure that workers are adequately insured.

SOCIAL AND COMMUNITY ISSUES:

■ Lydian should redesign its grievance mechanism to reflect international best-practice standards:

With respect to grievance management, although the current arrangement seems to attract a reasonable level of public participation, we do not consider Lydian's grievance mechanism as any longer 'fit for purpose'. Thus, we recommend that it be revamped so as to be better aligned with the UN Guiding Principles on Business and Human Rights effectiveness procedure.

■ Lydian should be tougher in enforcing social performance conditions on its contracting companies, especially in relation to local jobs and supply chain opportunities:

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■ Lydian should facilitate local communities in a process for defining their vision for their future both during and after the end of mining:

We strongly recommend that the company should persist in its engagement with local people to support them in defining what their vision is for the future of their area and what the success criteria should be for the local community and the mine in working together to support development.

RECOMMENDATIONS TO LYDIAN AND ITS STAKEHOLDERS

GENERAL:

The establishment of participatory monitoring programmes to strengthen public confidence:

We suggest that the company and its stakeholders consider agreeing on a process by which stakeholders agree criteria or indicators by which it can be shown if specific environmental concerns are valid, or not. This could be applied, for example, to specific areas of sensitivity such as ARD or the impact of cyanide. For example, when Lydian states that its ARD management plan means there will be no acidic discharge, and if concerned citizens agree that such an approach would theoretically alleviate their concerns, it should be possible to develop a participatory monitoring approach to determine if such discharge takes place, or not. This should then provide a platform for the company to establish, prior or close to commencing production, participatory monitoring programmes with local community representatives or other appropriate stakeholders on areas of concern.

WATER AND ACID ROCK DRAINAGE:

Establish a participatory water monitoring framework:

The Panel recommends that Lydian, members of the local community and other stakeholders establish an active and effective participatory water monitoring process. The Panel understands from Lydian that its past attempts to establish such a system failed to gain traction with local stakeholders (see Lydian's 2016 sustainability report). However, given that water clearly continues to be a major stakeholder concern and that there are different perspectives on the project's expected impacts, the Panel believes that active and effective participatory monitoring is an essential tool that Lydian and its critics should use to establish the facts about the project's water impacts (including, for example, whether there is evidence of ARD in any discharge). The Panel would recommend that all parties involved transparently publish the results from their respective tests and their findings. The Panel would also advise that stakeholders agree a process or protocol for what constitutes 'good' and 'bad' results beforehand.

DUST:

Dust should be a focus for a possible participatory monitoring initiative in part because the act of regular measurement and monitoring may help all actors to work together in mitigating the problem:

We recommend that Lydian and local stakeholders explore options for a participatory monitoring programme for dust.

BIODIVERSITY:

■ Lydian should consider advocacy with the government of Armenia for it to undertake a Strategic Environmental Assessment (SEA) of the mining sector going forward:

In the interests of more clearly positioning the mining sector in Armenia's future, it is recommended that advocacy to the government of Armenia encourages it to carry out a mining sector SEA to contribute to the creation of a strategic framework for the future, address concerns about the incremental and accumulative impacts of future mining investments and give Armenians the opportunity (that some clearly seek) to consider the role of the mining sector in Armenia's future.

■ Work on the Jermuk National Park needs to be accelerated and Lydian needs to clarify its ongoing role:

The Panel understands that the national park memorandum of understanding has yet to be finalised but our engagement with stakeholders suggests that work on the park needs to be ramped up soon. We recommend that Lydian encourages all parties to ensure that this happens, and, along with it, all roles and responsibilities are clearly defined. The importance of the national park proposal should not be underestimated and initial levels of commitment should be honoured.

HEALTH

■ Lydian and the government of Armenia should work to improve health data systems:

Currently the only level where a reliable data system on services provided may be available is on-site at the Maple Leafs facility. A plan should be developed to capture health-related data from the various components of the operations of existing facilities. The Panel would also welcome collaboration between Lydian and the government to plan for how regional data on health might be improved.

■ Lydian and the government should cooperate to improve the Jermuk facility:

This facility is located in one of the important touristic areas of Armenia. It clearly requires systematic upgrading. Considering its importance to both the township and the Lydian operations, independent and government efforts should be encouraged and assisted to ensure quality secondary healthcare is therefore available close to site.

■ Village health facilities should be developed as a system:

Although during visits to Gorayk and Saravan it was observed that Lydian is assisting with the provision of various health facilities in the villages, these efforts would be more successful if they were linked to an overall systemic quality improvement approach adopted for these village facilities by the Ministry of Health of Armenia.

SOCIAL AND COMMUNITY ISSUES:

Lydian should work with the Jermuk municipal authority to consider for the mine to augment the attractions of the area as a tourism centre:

We recommend that Lydian should consider the potential to develop Amulsar as an addition to the touristic attractions of Jermuk through, for example, a visitor centre, a field book of local fauna and flora, or support for a gold-themed museum in Jermuk. In light of the finding of the World Bank's Compliance Advisor/Ombudsman that the project's impact on local tourism is a potential area for improvement, Lydian might wish to work with relevant authorities in catalysing a new tourism strategy for the area.



4. Endpiece

In an environment that is seemingly characterised by distrust it is challenging for a company to establish a relationship with its stakeholders. Nonetheless, the Panel feels that Lydian has largely remained open to engagement and, in its communication efforts, the company has already moved from a 'trust us' approach to a 'we will show you' approach. The company now has an opportunity to better highlight, for example, how what we have termed Responsible Mining looks different from old-style mining.

In the Panel's view, Lydian is at an early stage broadly putting in place the right measures to ensure its presence at Amulsar is of benefit to the local communities and Armenia as a whole. Over the longer term, we urge the company to consider how it can best contribute to long-term development in Armenia as an investor, catalyst for change and significant economic contributor to the national economy. With this in mind, the company should take a systematic approach to its work in key areas (such as social investment and public health issues), and prioritise its projects in order to maximise its positive impacts, whilst being very clear about the proper role of activity for the private sector and not taking on roles which create an unhealthy dependence.

The Panel has been particularly impressed by the openness of Lydian in enabling us to examine all aspects of the health issue at the mine site and, as far as possible, in the communities close to and affected, in many ways, by the mine itself. We cannot escape feeling that the company and the public authorities need to enhance their collaboration, and give serious consideration to any measures which might enhance their collaboration, and key to this is responding to the evident need for a systems approach to health-care in the region. In particular, there is room for improvement with regard to health data. Just as we took the initiative last year, at the outset of construction, to have an expert team look at the data situation, so, as production beckons, we plan to re-

sit the matter of whether the collaboration that has emerged can be improved upon in the coming year.

We feel that the Amulsar project is good for the area, and will be very good for the people of the area the more a systems approach enhances the healthcare approach of the company, the communities, and the government of Armenia.

With a view to the longer term and in case of potential changes to the management regime, the durability of Lydian's commitments, be they concerning biodiversity, community development, health issues or others, is worth raising. We recommend that mechanisms which provide guarantees of the commitments, for instance in the form of an agreement with government, are put in place now should changes to ownership or other circumstances transpire.

The Panel is ready to now keep the project under well-intentioned review as it moves into actual production. Our next report will focus on the transition from the preparation to production, and we urge all Armenians to follow with keen interest the efforts of Lydian to make for a seamless transition from preparation to production, in ways which do no harm, but, in fact, do much good. In the meantime, we welcome all feedback from the project's stakeholders on the Panel's work to date.

In closing, the Panel would like to thank Bob Carreau (former VP Sustainability at Lydian International) for his support of the Panel's work. We recognise the good work that Bob, as a seasoned industry professional, has overseen in his role, and are pleased that this vital role will now be filled by a highly qualified and well-respected Armenian professional, Dr Armen Stepanyan. We wish Armen well in his work and call on the company to support him strongly in his efforts to ensure the impact of its positive contributions to communities in the Amulsar area and Armenia more broadly.

APPENDICES

1. Terms of Reference for the Amulsar Independent Advisory Panel

1. Background

1.1. Lydian International is beginning construction of the Amulsar gold project in Armenia. It is expected to go in to production in 2018 and has an anticipated mine life of 12 years thereafter. Lydian is committed to developing the project in accordance with Armenian legislation and international best practice standards.

1.2. Lydian is prepared to be held accountable to ensure its performance matches its intent. The company is therefore establishing an Independent Advisory Panel to strengthen stakeholder confidence and to provide objective advice on key stakeholder concerns, including environmental management; social management and public health; water management; biodiversity; all types of generated waste and cyanide management; socio-economic development; governance; and human rights.

environmental stewardship; social management and public health; water management; biodiversity; waste and cyanide management; socio-economic development; governance; and human rights.

- Monitor and if necessary strengthen the company's external stakeholder engagement activities.

2.2. The Panel's role will be authoritative but advisory. It will involve no executive authority or responsibility in relation to Amulsar. Lydian is not bound by the Panel's recommendations. However, where Lydian does not follow the Panel's recommendations, it undertakes to explain to the Panel the reasons for the actions it has taken. The Panel will be entitled to refer to such actions by the company in its public reporting.

2.3. The Panel will not be asked to provide an opinion on legal matters.

2. Purpose of the Panel and scope of work

In its Environmental and Social Impact Assessment, Lydian committed to establishing an Independent Advisory Panel to monitor and provide independent advice to the company on key sustainability issues around Amulsar, and to provide recommendations, as appropriate, on strengthening the company's approach.

2.1. Tasks of the Panel will include but are not be limited to:

- Critically appraising the social, environmental and human rights impacts of the Amulsar project and Lydian's plans and activities to manage, prevent and mitigate these impacts.
- Support and monitor the implementation of international best practice standards in Armenia.
- Provide independent and authoritative advice on

3. Membership

3.1. The Panel will be chaired by Dr John Harker, who will be supported by up to 6 other Panel members. The Panel members will be appointed by Lydian in consultation with Dr Harker and subject to the Chair's approval, and will be selected to address key issues of concern to stakeholders. Members will be expected to declare any potential conflicts of interest associated with their position on the Panel. Membership will generally be in a personal capacity.

3.2. Given the importance of the Panel's independence to its effectiveness, the Panel members must maintain unimpeachable personal integrity, and resist any pressure that might be brought to bear on their conclusions from any stakeholders or the company. No member of the Panel should have business links with Lydian or its shareholders.

3.3. The Panel shall reserve the right to revoke a panellist's membership should a panellist fail to meet the reasonable expectations of other members in terms of their time commitment or in the case of a breach of ethical standards. Such a decision will be made by a majority vote and a justification for any such removal must be provided. In such a case, the Chair will have communicated any membership concerns to a senior Lydian executive designated by the Chief Executive Officer (CEO), with the aim of first rectifying the issue.

4. Practical arrangements and reporting

4.1. The Chair and Lydian will consult and agree on policy and administrative support, to be provided by a Secretariat.

4.2. The Panel will submit its reports to Lydian's CEO and will be made available to Lydian's Board. Liaison between the Panel and Lydian shall fall to the Chair and the Secretariat, assisted by a senior Lydian executive designated for that purpose by the CEO.

4.3. The Panel will be funded by Lydian, and Lydian will provide per diem compensation to the Chair and to each Panel member who opts to receive it. This will include time spent on travel, preparation, meetings with stakeholders, and Panel discussions and meetings. Panel members will be requested to submit regular invoices to Lydian for payment. Panellists may also claim reasonable expenses, subject to approval in writing by Lydian. Should a panellist wish to donate his or her remuneration to a registered charity, this amount can be paid directly to the charity (subject to the organisation concerned passing appropriate due diligence).

4.4. The Panel will convene two or three times during the first 12 months of its mandate (at least two meetings will be held in Armenia), and at least twice annually thereafter. It will independently develop its work programme and research process, and set its own agendas in consultation with Lydian for meetings. It is expected to undertake field visits as part of its research, the logistical arrangements for which will be undertaken by Lydian.

4.5. Lydian undertakes to provide the Panel with accurate and comprehensive information related to Amulsar and to respond on a timely basis to requests for information. However, the Panel may additionally seek information from any party it considers appropriate as part of its work. The Panel may also draw on the services of specialists to examine specific issues if needed, and may request Lydian to provide the necessary funds. If Lydian does not approve such requests, it will explain its reasons for doing so and the Panel will be entitled to refer to this in its public report.

4.6. The Panel will produce an annual report setting out its findings and recommendations. The Panel will aim to produce its first substantive report around the end of the first quarter of 2018, which will cover the period up until the spring of 2018. The Panel's findings will be made available to the public. Lydian may choose to prepare a response to commentary and recommendations included in the report. If it chooses to do so, the response will be published alongside the Panel's report. The Panel may also choose, from time to time, to produce thematic reports on matters of concern to stakeholders.

4.7. After its report has been published, an annual formal roundtable meeting will be held between the Panel, external stakeholders and Lydian representatives. This will provide an opportunity for the Panel to present its findings and Lydian's response to those findings, as well as to solicit feedback. The Panel may also, in consultation with Lydian but at its own discretion, hold additional informal meetings with external stakeholders.

The work of the Panel will continue for an initial period of three years. After this point, the Panel and Lydian will conduct a joint stocktaking exercise, with input from external stakeholders, to evaluate whether the Panel's work has been useful and should be continued, and to make any necessary adjustments to the scope of work. Should the Panel be continued, ongoing membership terms of each individual panellist would be reviewed by Lydian and the Panel.

2. Biographies of Panel Members



Dr John Harker

Dr John Harker (Chair) is a leading international expert on Responsible Mining and multi-stakeholder processes. Dr Harker was most recently President and Vice Chancellor of Cape Breton University in Canada. In 1999/2000 he was asked by the Government of Canada to review whether the presence and conduct of the country's then largest oil company, Talisman, was exacerbating the then Sudanese civil war. He previously worked for the International Labour Organisation and advised President Nelson Mandela on the creation of a National Development Agency in South Africa. In 2007-8, he chaired an Independent Review Panel of experts at Cerrejón in Colombia, South America's largest coal mining operation.



Dr Haroutune Armenian

Dr Haroutune Armenian is an internationally respected public health expert. He is President Emeritus and former President of the American University of Armenia (AUA). He is also Professor in Residence of epidemiology at the UCLA Fielding School of Public Health, and Professor Emeritus at Johns Hopkins Bloomberg School of Public Health. Dr Armenian leads the Turpanjian Rural Development Program, which has established over 350 businesses in rural areas of Armenia.



Nune Harutyunyan

(Panel member from January 2018)



Dr Hayk Akarmazyan

Dr Hayk Akarmazyan is an Armenian environmental expert. He has a PhD in Environmental Chemistry and he is currently an Associate Professor at the National Polytechnic University of Armenia, where he lectures on environmental management and environmental economics.

Nune Harutyunyan is a leading environmental management and sustainable development professional, with 24 years of experience in international and regional multi-stakeholder cooperation. She is a Director of the Regional Environmental Centre for the Caucasus and is an expert in environmental compliance and legislation, resource efficiency and cleaner production, institutional and legal frameworks, and green economic development. She has previously worked for the Ministry of Foreign Affairs of Armenia, UNDP, the Asian Development Bank, UNIDO and other donor organisations.



Jon Hobbs

Jon Hobbs is a leading international environmental professional. Between 2010 and 2017, he served as WWF's (World Wide Fund for Nature) International Director on Extractives having previously served for ten years in a similar role with the United Kingdom's Department for International Development. He is also former Chair of the OECD's Environmental Professionals Network (Environet) and the Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development. He has contributed to the development of numerous international initiatives around Responsible Mining.



Luc Zandvliet

Luc Zandvliet is a socio-economic expert, with particular expertise in advising mining companies on stakeholder engagement, grievance management and prevention, and social investment strategies. He is co-author of the leading book for social performance practitioners 'Getting it Right Making Corporate-Community Relations Work'.



Alisa Savadyan

(Panel member from April to July 2017)

Alisa Savadyan is an Armenian social and environmental impact specialist, and environmental lawyer. She provides advice on rural development, water management and waste management projects financed by the World Bank, USAID, the European Bank of Reconstruction and Development (EBRD) and the Asian Development Bank (ADB).



Cathy Reichardt

(Panel member from March 2018)

Cathy Reichardt is a leading environmental specialist who has worked for 30 years in the mining industry and in academia on the industry's environment and social impacts. She has a background as a hydrogeologist and has worked with over 50 gold projects globally on managing water and environmental issues. Cathy has experience in the construction, commissioning and operation of heap leach facilities. She has been registered as an auditor tasked with checking corporate compliance under the International Cyanide Management Code since 2006. She also previously served on the World Bank's/International Finance Corporation's (IFC) review panel for the organisation's Ombudsman and Compliance Advisory Office (CAO) between 2001 and 2005.

3. Panel's Stakeholder Engagement

One of the Panel's principal roles is to interact with a selection of Lydian's local, national and international stakeholders so as to understand their perspectives. This engagement provides a channel through which the Panel can stay informed of stakeholder concerns, and thereby helps to define the areas in which to monitor and assess Lydian's performance. The Panel has sought to interact with a broadly representative sample of stakeholders including, where they have been willing to engage, project critics.

Issues raised by stakeholders during the Panel's interactions have included: management of dust; local job opportunities; impacts on biodiversity; cyanide management; water and ARD issues; public health; tourism; national governance issues; and an alleged lack of objectivity in Lydian's ESIA.

Amongst the stakeholders and experts with whom the Panel and Panel members have interacted individually or collectively to inform its work include:

- Community members from Jermuk, Gndevaz, Gorayk and Saravan (including citizen members of the CLCs, local business owners, and other residents including opponents of the project)
- Local NGOs such as the Jermuk Development Centre and Community Initiative for Development
- Mayor of Jermuk and Mayor of Gorayk, and the former Mayor of Gndevaz
- Local healthcare representatives
- Lydian employees
- Co-ordinators of the Jermuk National Park
- Senior government officials, such as the Deputy Minister of Energy Infrastructure and Natural Resources
- Members of the EITI Multi-Stakeholder Group, including government and civil society representatives (but not, sadly, industry representatives beyond Lydian)
- Representatives and students from academic and professional institutions, such as the American University of Armenia and Yerevan State University
- Representatives from NGOs such as WWF Armenia, EcoRight, Civil Voice, Bankwatch and Ecolur
- Officials from trade unions and business associations including Republican Union of Employers of Armenia, Union of Manufacturers and Businessmen (Employers), Confederation of Trade Unions of Armenia
- Tour operators and members of bird associations in Yerevan
- United Nations Industrial Development Organization (UNIDO) Armenia Country Representative
- Representatives from US and British embassies, World Bank and EBRD
- Members of the Armenian diaspora
- Lydian expert consultants including from Wardell Armstrong and Global Resource Engineering
- Media and journalists

In some instances, stakeholders declined invitations from the Panel to engage, including Harout Bronozian and the Armenian Environmental Front. The Panel would like to reiterate its invitation to these and other stakeholders to engage with our work.

4. Brief Overview of the Amulsar Project

The Amulsar gold project is 100% owned by Lydian International, a gold mine developer listed on the Toronto Stock Exchange (TSX).

As of the end of 2017, Lydian's leading shareholders included:

- Resource Capital Fund VI L.P.
- Orion Mine Finance Management Limited
- Franklin Resources, Inc.
- European Bank for Reconstruction & Development
- Donald Smith Value Fund LP
- Amber Capital UK LLP
- ASA Gold & Precious Metals Fund
- RBC Asset Management

The Amulsar project is located in south-eastern Armenia, 170km from Armenia's capital Yerevan and on the border between the Vayots Dzor and Syunik provinces. Its mineral resource is estimated to be nearly 5 million ounces.

Lydian is required to comply with the Performance Requirements of the European Bank for Reconstruction and Development (EBRD), which has been invested in Lydian since 2009, and the Performance Standards of the International Finance Corporation (IFC).

Amulsar's Mining Right was initially granted in 2014, and followed by a subsequent Mining Right amendment in 2016 that incorporated the current Development Plan. The company submitted an extensive Environmental and Social Impact Assessment (ESIA) in 2015, which was updated in 2016 to reflect project design changes.

Construction at the Amulsar project began in late 2016, ramping up significantly in 2017. Production is anticipated to begin during the second half of 2018, with expected average annual output of 225,000 gold ounces over an initial ten-year period. Post-closure reclamation and maintenance are expected to continue for at least five years thereafter.

The Amulsar project currently employs approximately 1,300 people. Once in production, it is expected that the mine will directly provide employment to around 770 people. Lydian aims to fill 95% of operational jobs with Armenian nationals and 40% of total jobs with local residents from the nearby villages of Gndevaz, Saravan, Gorayk and Kechut/Jermuk. Across the project lifetime, Lydian expects to be one of the top five corporate taxpayers in Armenia, generating approximately US\$488m through taxes and royalties during the ten-year currently planned production phase.

5. Brief Overview of Armenia's Mining Sector

The mining sector is an important part of Armenia's economy and is one of the fastest developing industries in the country. The sector is a significant contributor to GDP (approximately 5% in 2016) and to public revenues. Between 2012 and 2014, it provided on average 4.8% of overall tax revenue, and 8.2% of direct tax revenue. Mining provides roughly 10% of total industrial employment, or approximately 2% of total employment, and offers comparatively well-paid jobs outside of Yerevan.

Metals, particularly copper, dominate Armenia's exports; around one third of total merchandise exports were attributable either to mining or downstream metals production activities from 2006-2014. As a result, fluctuations in the global copper price have a significant impact on Armenia's economy.

Copper and gold are the main minerals found in Armenia, with smaller deposits of iron, lead, zinc and silver. Mineral resources in Armenia tend to be concentrated in the southern region.

Armenia's largest copper mine is the open-pit Kajaran mine, which produces some 18.5Mt of ore per year (60% of mining sector turnover). It is operated by Germany's CRONIMET through its majority stake in Armenian-owned ZCMC. The second largest copper mine is the recently built Teghut copper and molybdenum mine, run by the Armenian Vallex Group.

Currently, the country's two largest gold mines are operated by London-listed Polymetal International (which acquired the Kapan mine, also known as Shahumyan, from Dundee Precious Metals in 2016) and Russian-owned GeoProMining. The latter is currently investing in the technical re-equipment of the Zod mine's Sotk gold deposit, which ceased operations in 2007.

With estimated resources of 142.2 million tonnes and mineral reserves of 2.606 million contained gold ounces, Lydian's Amulsar project is set to become the largest gold mine in Armenia when it enters operation. Lydian is already a major contributor to FDI and is the country's sixteenth largest corporate taxpayer. Meanwhile, Global Gold, headquartered in New York, has a major gold and silver project at Toukhmanuk, a gold and silver deposit at Marjan and a promising gold exploration property at Getik.

Whilst Armenia has a history of mining dating back 5000 years, the modern mining industry was established during the Soviet period. Intensive growth took place in the late 1950s and early 1960s, and again in the late 1970s and 1980s, as major mining and refining complexes were established at Kajaran, Kapan, Zod and Alaverdi. Following independence, Armenia's economy underwent major structural changes and the mining sector was privatised. The country's mineral wealth has since attracted significant interest from foreign investors, though low metal prices in recent years and the ongoing conflict with neighbouring Azerbaijan are perceived to have depressed foreign direct investment levels.

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