



Details of Sasa mine tailings storage facilities in North Macedonia, in accordance with the Church of England Pensions Board request, April 2019

1. "Tailings Facility" Name/identifier	<p>Please identify every tailings storage facility and identify if there are multiple dams (saddle or secondary dams) within that facility. Please provide details of these within question 20.</p> <p>TSF 1 TSF 2 TSF 3-1 TSF 3-2 TSF 4</p>
2. Location	<p>Please provide Long/Lat coordinates</p> <p>Gauss–Krüger coordinate system: TSF 1: Y=7 626 188; X=4 664 211 TSF 2: Y =7 626 384; X= 4 663 656 TSF 3-1: Y =7 626 777; X= 4 663 584 TSF 3-2 (active): Y =7 627 228; X= 4 663 165 TSF 4 (in construction): Y =7 627 601; X= 4 662 437</p>

3. Ownership	<p>Please specify: Owned and Operated, Subsidiary, JV, NOJV, as of March 2019</p> <p>All TSFs are owned by Sasa mine, which is a subsidiary of Central Asia Metals and was acquired by the Company in November 2017</p>
4. Status	<p>Please specify: Active, Inactive/Care and Maintenance, Closed etc.</p> <p>TSF 1: closed TSF 2: closed TSF 3-1: closed TSF 3-2: active TSF 4: in construction</p> <p>To clarify – for Sasa the term ‘closed’ refers to the following: A closure plan has been developed and approved by the relevant local government agency.</p> <p>A ‘closed TSF’ refers to a TSF that has an approved closure plan that has been fully implemented or the closure plan is in the process of being implemented.</p>
5. Date of initial operation	<p>(date)</p> <p>TSF 1 - 1964 TSF 2- 1974 TSF 3-1 - 1990 TSF 3-2 – 2007</p>
6. Is the Dam currently operated or closed as per currently approved design?	<p>Yes/ No. If 'No', more information can be provided in the answer to Q.20</p> <p>TSF 1: Closed (TSF 1 was operational from 1964-1974. It is closed, but original Project design has not been located. However, Sasa Closure Plan developed by SRK in June 2017 includes TSF 1 closure).</p> <p>TSF 2: Closed (TSF 2 was operational from 1974-1990. It is closed, but original Project design has not</p>

	<p>been located. However, Sasa Closure Plan developed by SRK in June 2017 includes TSF 2 closure).</p> <p>TSF 3-1: Closed (TSF 3-1 was operational from 1990 to March 2003, when the mine closed. Operations recommenced and the facility was in use again in June 2006 - 2007. TSF 3-1 was closed according to the Project design, which was specified in 2008 by Geologing DOO, Skopje. Sasa Closure Plan developed by SRK in June 2017 also includes TSF 3-1 closure).</p> <p>TSF 3-2: Active/operational (A Mineral Waste Management ('MWM') plan was developed in 2014 by UGD Stip and was submitted and approved by Ministry of Economy and Ministry of Environment and Physical Planning. MWP includes the closure plan for TSF 3-2. Also, Sasa Closure Plan developed by SRK in June 2017 includes TSF 3-2 closure).</p> <p>TSF 4: In construction (A Mineral Waste Management ('MWM') plan was developed in 2014 by UGD Stip and was submitted and approved by Ministry of Economy and Ministry of Environment and Physical Planning. MWP includes the closure plan for TSF 4. Also, Sasa Closure Plan developed by SRK in June 2017 includes TSF 4 closure).</p>
7. Raising method	<p>Note: Upstream, Centerline, Modified Centerline, Downstream, Landform, Other.</p> <p>TSF 1 - Downstream method TSF 2 - Downstream method TSF 3-1 - Downstream method TSF 3-2 - Downstream method TSF 4 - Downstream method</p>
8. Current Maximum Height	<p>Note: Please disclose in metres agl (above ground level)</p> <p>TSF 1 - 44m agl TSF 2 - 62m agl TSF 3-1 - 61m agl TSF 3-2 - 63m agl TSF 4 - 61m agl according to Project design</p>

<p>9. Current Tailings Storage Impoundment Volume</p>	<p>Note: (m³ as of March 2019)</p> <p>TSF 1 - 1,398,000 m³ TSF 2 - 4,775,000 m³ TSF 3-1 - 4,900,000 m³ TSF 3-2 - 4,923,388 m³ March 2019 TSF 4 - minimum of 2,785,309m³ according to Project design</p>
<p>10. Planned Tailings Storage Impoundment Volume in 5 years' time.</p>	<p>(m³ as planned for January 2024)</p> <p>Total designed storage capacity for 5 years = 2,000,000m³: TSF 3-2 = 278,107m³, TSF 4 = 1,721,893m³</p>
<p>11. Most recent Independent Expert Review</p>	<p>(date) For this question we take 'Independent' to mean a suitably qualified individual or team, external to the Operation, that does not direct the design or construction work for that facility.</p> <p>TSF 4 Qualitative Risk Assessment Memo - SRK Consulting (UK) Limited, October 2018</p> <p>TSF 3-2 Stability Review - Golder Associates (UK) Ltd, March 2019</p>
<p>12. Do you have full and complete relevant engineering records including design, construction, operation, maintenance, and/or closure?</p>	<p>(Yes or No) We take the word "relevant" here to mean that you have all necessary documents to make an informed and substantiated decision on the safety of the dam, be it an old facility, or an acquisition, or legacy site. More information can be provided in your answer to Q.20</p> <p>Yes, more information provided in Q.20</p>
<p>13. What is your hazard categorisation of this facility, based on the consequence of failure?</p>	<p>Very high consequences if failure occurred</p>
<p>14. What guideline do you follow for the classification system?</p>	<p>Canadian Dam Association Dam Safety Guidelines (CDA, 2013)</p>

<p>15. Has this facility, at any point in its history, failed to be confirmed or certified as stable, or experienced notable stability concerns, as identified by an independent engineer (even if later certified as stable by the same or a different firm).</p>	<p>(Yes or No) We note that this will depend on factors including local legislation that are not necessarily tied to best practice. As such, and because remedial action may have been taken, a "Yes" answer may not indicate heightened risk.</p> <p>Stability concerns might include toe seepage, dam movement, overtopping, spillway failure, piping etc. If yes, have appropriately designed and reviewed mitigation actions been implemented?</p> <p>We also note that this question does not bear upon the appropriateness of the criteria, but rather the stewardship levels of the facility or the dam. Additional comments/information may be supplied in your answer to Q.20.</p> <p>Yes - in 2003 while Sasa mine was not operational and prior to Central Asia Metals' ownership. More information provided in Q.20</p>
<p>16. Do you have internal/inhouse engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?</p>	<p>Note: Answers may be "Both".</p> <p>Yes, both: internal TSF specialist employed directly by Sasa, plus external engineering support</p>
<p>17. Has a formal analysis of the downstream impact on communities, ecosystems and critical infrastructure in the event of catastrophic failure been undertaken and to reflect final conditions? If so, when did this assessment take place?</p>	<p>Note: Please answer 'yes' or 'no', and if 'yes', provide a date.</p> <p>Yes</p> <ul style="list-style-type: none"> • Flood wave consequences analysis, designed by Faculty of Civil engineering Skopje, 2013 • Flood wave consequences analysis report, designed by Faculty of Civil engineering Skopje, 2013 • TSF 4 Qualitative Risk Assessment Memo, performed by SRK Consulting (UK) Limited, October 2018
<p>18. Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?</p>	<p>Please answer both parts of this question (e.g. Yes and Yes)</p> <p>a) Yes, there is a closure plan in place – ‘Sasa Closure Plan’, developed by SRK in June 2017. This closure plan covers all facilities (TSF 1, TSF 2, TSF 3-1, TSF 3-2, TSF 4)</p> <p>b) Yes, closure plan includes long term monitoring, specifying a minimum of 5 years post closure.</p>

	Note that long term monitoring procedures are already in place
19. Have you, or do you plan to assess your tailings facilities against the impact of more regular extreme weather events as a result of climate change, e.g. over the next two years?	<p>(Yes or No)</p> <p>Yes. Currently undertaking a hydrological study of the catchment and will review return periods, extreme events etc</p>
<p>20. Any other relevant information and supporting documentation.</p> <p>Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.</p>	<p>Note: this may include links to annual report disclosures, further information in the public domain, guidelines or reports etc.</p> <p>Other relevant information:</p> <ul style="list-style-type: none"> • Opinion on Sasa TSF stability, prepared by Prof. Petkovski, 2019 • Operational plan for prevention and protections against floods, designed by Faculty of Civil engineering Skopje, 2014 • TSF 4 Qualitative risk assessment memo, performed by SRK Consulting (UK) Limited, October 2018 • Operational plan for implementation of technical monitoring of tailings dams with accompanying facilities and tailings ponds at Sasa Mine, prepared by Prof. Petkovski and Prof. Golomeov, 2019 • Monthly reports on integrity and functionality of the SASA tailings dams, designed by Prof. Golomeov, UGD Stip • Annual report on integrity and functionality of the SASA tailings dams, designed by UGD Stip, 2018 • Summary report on the General condition of the dams of special interest of the R. Macedonia, prepared by dam commission within MoEPP, 2015 <p>Information related to Q.1:</p> <p>TSF 1, TSF 2, TSF 3-1, TSF 3-2 and TSF 4 are cascaded downstream and all TSF's are connected in one valley.</p>

	<p>Information related to Q.15:</p> <p>On 30 August 2003, in the order of 150,000m³ of tailings leaked from TSF3-1 via a diversion tunnel and into the River Kamenica during a period when the mine was not operational and prior to Central Asia Metals ownership. The cause of the failure was a defective 'cap' within the roof of the ancillary pipe carrying TSF 3.1 drainage into the underlying river diversion structure (i.e. not a direct failure of the river diversion structure). A clean up of the tailings that were released into the river and a full repair of the diversion tunnel was performed according to a design approved by the regulatory authorities. All activities were conducted by independent contractors under the supervision of the appropriate regulatory authorities.</p>
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The information contained within this document has been approved by Central Asia Metals' Chief Executive Officer.



**Nigel Robinson
Chief Executive Officer**