MANAGEMENT OF TAILINGS STORAGE FACILITIES

Polymetal International plc • MAY 2019

POLYMETAL
INTERNATIONAL PLC

Introduction

In environmental stewardship, we focus on zero-harm principles when designing and operating our mines. In the countries where we operate, environmental legislation sets out strict requirements to prevent soil and water contamination.

All our tailings storage facilities (TSF) undergo regular audits for compliance with these requirements as well as safety examinations. TSFs are regularly monitored by our on-site environmental and engineering teams. Pipelines, pump stations, water levels and dams are inspected on daily basis. We ensure emergency preparedness and response procedures at all stages of TSF life, from design to operation to closure.

In 2018, we enhanced corporate TSF management system to improve control and increase the rigour of assessment and management of tailings storage facilities, including emergency response plans. . The goal is to eliminate causes of dam failure, such as poor management and inadequate planning for heavy precipitation, which often increase the probability of accidents. We now operate nine tailings dams, and historically there have been no environmental accidents involving tailings facilities at our operations.

Increasingly, we are shifting towards safer methods of waste storage, such as the dry stack (filtered cake) tailings. Dry tailing storage significantly reduces the possibility of dam failure, drastically lowers the potential damage from such accident, and eliminates tailings run-off.

Technical overview

In Polymetal, there are two types of tailings storage:

1. Traditional method of hydraulic filling of tailings in the storage;

2. Tailings filtration and dry stacking in piles.

When designing TSF, the following features are taken into account: engineering and geological conditions, climate conditions (precipitation, evaporation, seismic) and the availability of materials for construction.

As of today, Polymetal operates:

- 5 upstream TSFs (when consecutive dam is elevated with partial resting on the previously constructed wall);
- 3 downstream TSFs;
- 1 centerline TSF;
- and 2 dry stacking facilities

Polymetal intends to use dry stacking at all new projects as long as it is physically possible. The two projects currently in construction, Nezhda and POX-2, tailings will be deposited as dry filtered cake.

To reduce risks of TSF operation and risks of potential changes in geological conditions, we conduct engineering, seismic, and geological surveys and test pulp at least once in 5 years. Using monitoring data (temperature of soils, depression curve) and physical features of materials used for the TSF foundation and dam construction, we adjust stability calculations and risk assessment. All this enables us to reassessthe most severe consequences in case of hydrodynamic accident and we correct accordingly.

Furthermore, we have estimated potential damage areas in case of an emergency. At all of Polymetal's TSFs, emergency failure will have no impact on settlements, buildings, structures or facilities where people may be present. Thus, the risk of loss of human life is minimal.

After recent tailings disasters, we thoroughly reviewed all of our upstream TSFs and conducted visual, geological, engineering and hydrological surveys. We have done thermal, stress-strain and stability calculation which we used as confirmation to further elevate and operate dams in a safe way.

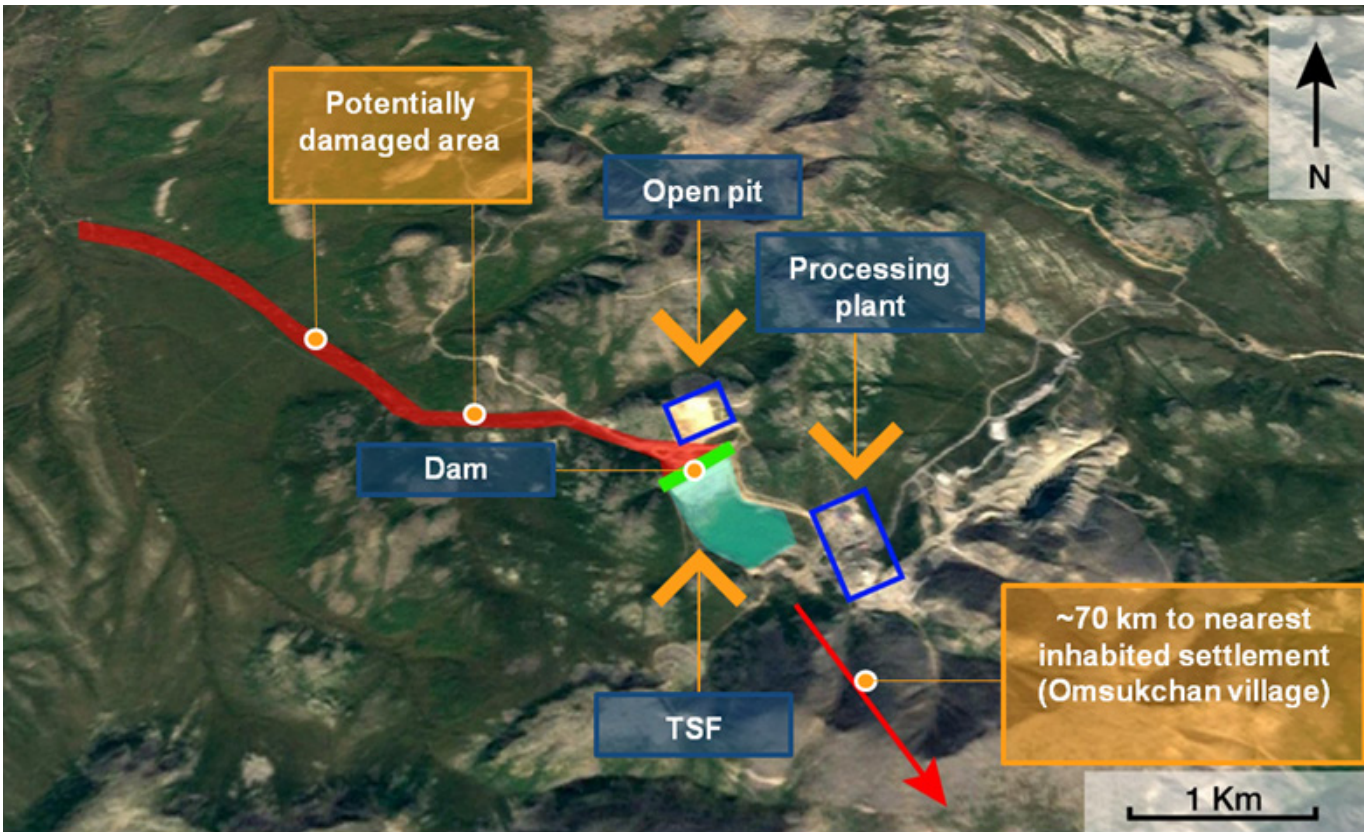
Lunnoye TSF

1	"Tailings Facility" Name/identifier	**Lunnoye TSF** **Key facts:** — raising from the centreline to downstream slope, — valley-fill type, — beach width is not regulated, — water pressure on the dam is permitted, — raised in 5 phases.
2	Location	N 65°05′00″ E 155°05′08″
3	Ownership	Joint Stock Company "Magadan Silver"
4	Status	Active
5	Date of initial operation	2001
6	Is the Dam currently operated or closed as per currently approved design?	Operated as per currently approved design
7	Raising method	Modified raising — from centreline to downstream slope
8	Current Maximum Height	50 m
9	Current Tailings Storage Impoundment Volume	4,194,361 m^3
10	Planned Tailings Storage Impoundment Volume in 5 years' time	1.04.2019 — 31.12.2024: 1,520,224 m^3 Total by 2024: 5,714,585 m^3 * Figures have been estimated under the corporate long-term plan updated in 2019, adjusted with the filling coefficient.
11	Most recent Independent Expert Review	2019 — Lunnoye silver-gold mine, Tailings Storage Facility Audit Report by Knight Piésold Limited. 2018 — by JSC Russian Scientific and Research Institute named after B.E. Vedeneev. 24.02.2016 — Experts' Review of the TSF safety declaration by Scientific, Technological, Design and Expertise Centre Protechexpert. 12.10.2015 — by an inspection team (representatives of the company-operator, Russian Federal Environmental, Industrial and Nuclear Supervision Service (Rostechnadzor) and Ministry of Emergency Response) — as a check before issuing a permission paper and putting it in the official register.
12	Do you have full and complete relevant engineering records including design, construction, operation, maintenance, and/or closure?	• Tailings dam reconstruction project by CJSC Polymetal Engineering, St-Petersburg, 2006, ref. No 10010312601-PZ. • Industrial Safety Expert Review for the tailings dam reconstruction project. • Safety Declaration ref. No 16-16(03)0028-00-GOR, approved on 4.02.2016, including: — tailings dam monitoring project; — safety criteria; — potential damage estimation; — experts' review of the facility readiness to emergency consequences mitigation; — emergency response plan updated annually; — tailings dam operation procedures; — job description and occupational health and safety guidelines. • Experts' Review on the TSF safety declaration ref. No 00-DB-0060-2017.

13	What is your hazard categorization of this facility, based on the consequence of failure?	• TSF category (depending on consequences of potential hydrodynamic emergency) — IV, low hazard. — Number of permanent residents — none; — Living environment is not disturbed; — Harm to ecosystem is not significant with maximum cost of damage rehabilitation estimated at USD 1.7 m; — Potential failure would be within the land plots leased to the company and can affect less than 7 employees. • TSF category depending on dam height and ground type — II, high hazard. • TSF category under Dam Safety Reference Book of CDA (CDA, 2014) — significant.
14	What guideline do you follow for the classification system?	Russian State Regulation No 986 of 2.11.2013 "On Hydraulic Structure Classification". Dam Safety Reference Book of CDA (CDA, 2014) — used for corporate purposes as a reference source.
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)?	The facility did not fail to be confirmed or certified as stable or experience notable stability concerns. No risks affecting stability have been identified during the facility operation. Management efficiency is regularly estimated under the corporate "TSF Management System" and applicable legal requirements.
16	Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	During the construction stage we use designer supervision. During operation, we ensure internal control on the TSF condition under the corporate "TSF Management System". **There are several types of control checks:** **Scheduled:** **a)** Level 1 — carried out by an employee responsible for the TSF at the operation; **b)** Level 2 — carried out by other technical specialists at the operation; **c)** Level 3 — carried out by representatives of Polymetal Management Company (as consulting). **Unscheduled:** **a)** in case of system processes review — initiated by the Company's Top Management (Group CEO, COO, managing director of the project); **b)** in case of multiple violations of legislative, regulatory and other requirements, applied to the TSF; **c)** in case of identifying adverse trends as a result of statistics analysis; **d)** in case of accidents (emergencies) affecting safety level at the TSF.
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?	Impact assessment of potential hazards for life, health and property in case of TSF failure was done by Promtechnologia LLC, Belgorod in 2018. It was then approved by local governmental authorities (Ministry of Natural Resources and Ecology in the Magadan region).
18	Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	**a)** There is a closure plan. A land reclamation section is included in the design documentation. **b)** As for now, the closure plan does not include long term monitoring. The program is a part of a Reclamation Project and will be developed in detail by the time of the TSF closure.
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?	There is a scenario of dam failure caused by an externality (natural disaster) in the potential damage estimation (clause 17): the emergency probability there is assessed as low.

20	Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.	• Raising method — raising from the centreline to downstream slope. • Raised in 5 phases with final elevation of 830 m. Total dam length is 480 m. • The dam is constructed using local crushed stone with 1.5 mm thick shield of HDPE geomembrane. • Drainage system is in place. A drainage system along dams is available to prevent seepage and includes pipe drains, drain headers, pump stations and cycled water pipelines, designated for the following purposes: — arranged diversion of seepage through the dam body and toe; — eliminating seepage inflow to the downstream slope and freezing zone; — improving the downstream slope stability. • Normative safety factor adjusted for this category of facility for solidity and consequences significance should be equal or more than 1.20. Safety factor calculated for the current TSF equals to 1.25. • The facility is officially in the Russian Register of Hydraulic Structures http://waterinfo.ru/gts/do_look.php?regnum=219440001071000 • We have a complete package of design documentation and permits on hand. • The watershed area is 3.191 км^2. • The TSF is dyked (hydro-protected) by a stream diversion channel, designed to hold maximum seasonal and rainfall flood flows with 0.1% annual exceedance probability. • Luna TSF is located in the areas with seismic levels of 7 and 8. • TSF is located in a region prone to earthquakes and has the potential to experience ground shaking levels of Intensity 7 (VII) to 8 (VIII). • The probability of an earthquake magnitude 7 is 10% within the next 50 years, i.e. once every 500 years, and the probability of an earthquake magnitude 8 is 1% within the next 50 years, i.e. once every 5000 years. • Seismic microregioning of the assessment of the impact of the local conditions on the seismic activity of the TSF area: — TSF bed — seismicity 7.32 and peak acceleration — 0.167 g, or 164.0 cm/s^2; — Enclosing dam — seismicity 6.79 and peak acceleration — 0.111 g, or 109.0 cm/s^2; — Adjacent massifs — seismicity 6.74 and peak acceleration — 0.108 g, or 106.0 cm/s^2. • The area flooded in case of hydrodynamic accident at TSF No. 2 would be about 1.5 km^2. • Spill discharge volume is estimated at 973,000 m^3. • Overfilling of the TSF impoundment and the spill over the dam crest may occur in case of: — receiving a surface runoff with 1% Annual Exceedance Probability, — failure of the stream diversion channel and interception channel (including timely snow clearing) and — uncontrolled filling of the TSF with simultaneous suspension of water withdrawal from it. • The likelihood of a hydrodynamic accident has been estimated to be minimal because the design provides for at least 1.5 m freeboard between the TSF filling level and the dam crest elevation.

Lunnoye TSF location and affected area in case of dam failure



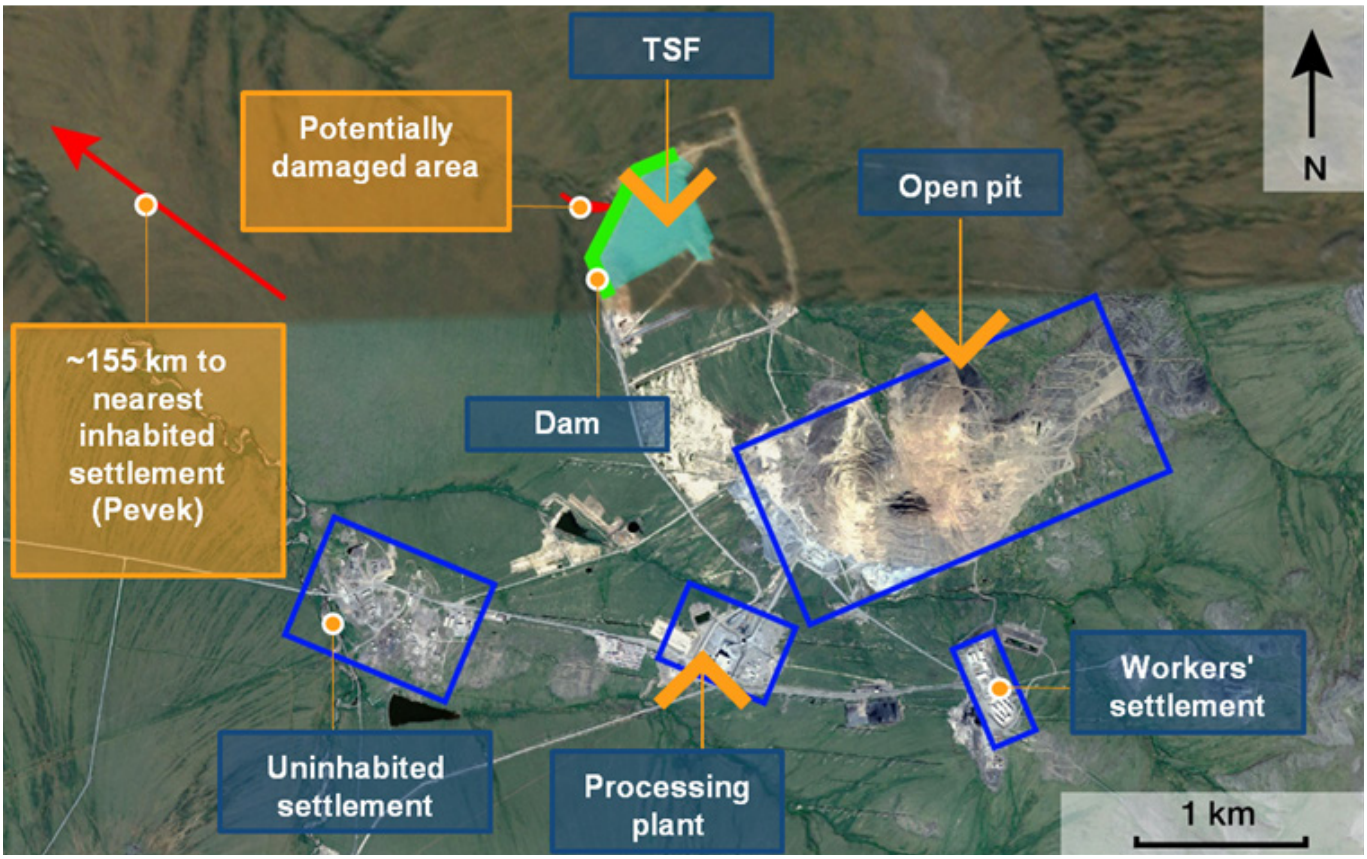
Mayskoye TSF

1	"Tailings Facility" Name/identifier	**Mayskoye TSF** **Key facts:** — downstream raising valley-fill type, — constructed using imported ground, — beach width has no limits, — water pressure on the dam is permitted, — raised in 3 phases.
2	Location	N 68°59′24″ E 173°44′17″
3	Ownership	Limited Liability Company "Gold Mining Company Mayskoye"
4	Status	Active
5	Date of initial operation	1.04.2012
6	Is the Dam currently operated or closed as per currently approved design?	Operated as per currently approved design
7	Raising method	Downstream
8	Current Maximum Height	23 m
9	Current Tailings Storage Impoundment Volume	3,353,037 m^3
10	Planned Tailings Storage Impoundment Volume in 5 years' time	1.04.2019 — 31.12.2024: 3,712,341 m^3 Total by 2024: 7,065,378 m^3 * Figures have been estimated under the corporate long-term plan updated in 2019, adjusted with the filling coefficient.
11	Most recent Independent Expert Review	27.10.2017 — by inspection team (representatives of the company-operator, Russian Federal Environmental, Industrial and Nuclear Supervision Service (Rostechnadzor) and Ministry of Emergency Response) — as a check before issuing a permission paper and putting it in official register. 26.06.2018 — by JSC Russian Scientific and Research Institute named after B.E. Vedeneev.
12	Do you have full and complete relevant engineering records including design, construction, operation, maintenance, and/or closure?	Yes
13	What is your hazard categorization of this facility, based on the consequence of failure?	• TSF category (depending on consequences of potential hydrodynamic emergency) — IV, low hazard: — Number of permanent residents — none; — Living environment is not disturbed; — Harm to ecosystem is not significant damage rehabilitation costs less than USD 1.7 m; — Potential failure would be within the land plots leased the company. • TSF category depending on dam height and ground type — II, high hazard. • TSF category under Dam Safety Reference Book of CDA (CDA, 2014) — significant.
14	What guideline do you follow for the classification system?	Russian State Regulation No 986 of 2.11.2013 "On Hydraulic Structure Classification". Dam Safety Reference Book of CDA (CDA, 2014) — used for corporate purposes as a reference source.

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)?	The facility did not fail to be confirmed or certified as stable, or experienced notable stability concerns. No risks affecting stability have been identified during the facility operation. Management efficiency is regularly estimated under the corporate "TSF Management System" and applicable legal requirements.
16	Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	During the construction stage we use designer supervision. During operation, we ensure internal control on the TSF condition under the corporate "TSF Management System". **There are several types of control checks:** **Scheduled:** **a)** Level 1 — carried out by an employee responsible for the TSF at the operation; **b)** Level 2 — carried out by other technical specialists at the operation; **c)** Level 3 — carried out by representatives of Polymetal Management Company (as consulting). **Unscheduled:** **a)** in case of system processes review — initiated by the Company's Top Management (Group CEO, COO, managing director of the project); **b)** in case of multiple violations of legislative, regulatory and other requirements, applied to the TSF; **c)** in case of identifying adverse trends as a result of statistics analysis; **d)** in case of accidents (emergencies) affecting safety level at the TSF.
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?	2017 — Impact assessment of potential hazards for life, health and property in case of TSF failure was done by LLC NTTs Spetspromhydrotech, Moscow. It was then approved by local governmental authorities.
18	Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	Technical measures for closure/reclamation are specified in the TSF design documentation, which was signed-off by the State Commission. According to the legal requirements, a decision on closure is made in accordance with its design life time. **Closure project contains the following:** **a)** Measures for closure/reclamation; **b)** People responsible for TSF safety during closure/reclamation (officials or organization); **c)** Period of closure/reclamation measures; **d)** Evaluation and forecast of possible changes of natural and man-made conditions of the TSF after its closure/reclamation. This evaluation can be made by contractor who has permission for design and engineering surveying if this evaluation or forecast was not a part of initial TSF design package.
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?	Yes. There is a scenario of dam failure caused by an externality (natural disaster) in the potential damage estimation (clause 17): the emergency probability there is assessed as low.

20	Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.	• The dam is constructed using local crushed stone with 1.5 mm thick shield of HDPE geomembrane. In order to eliminate any seepage, a 6 m deep core trench is excavated and filled with loam, where a film shield is embedded. • The dam crest width is 11 m, upstream slope is 1:3, general downstream slope is 1:2. Maximum total dam height is 23 m. • The dam is raised in 3 phases using a downstream raising method. The dam crest elevation is 246.0 m for phase 1, 251.0 for phase 2 and 255.0 m for phase 3. • A drainage system along damsis available to prevent seepage andincludes pipe drains, drain headers, pump stations and cycled water pipelines. • The normative safety factor is adjusted for this category of facility for solidity and consequences significance should be equal or more than 1.20. • The safety factor is calculated for the current TSF equals 1.38. • The facility is officially in the Russian Register of Hydraulic Structures. http://waterinfo.ru/gts/do_look.php?regnum=219770000583400 • We have a complete package of design documentation and permits on hand. • The TSF is located in a region prone to earthquakes and has the potential to experience ground shaking levels of Intensity 6 (VI). • The total watershed area is 3.96 km^2. • The TSF is dyked (hydro-protected) by a stream diversion channel and an interception channel, which are designed to hold maximum seasonal and rainfall flood flows with 0.1% annual exceedance probability as a verification case and 1% annual exceedance probability as a base case. • The area flooded in case of an hydrodynamic accident would be approximately 0.11 km^2. • Spill discharge volume is estimated at 3,276,790 m^3. • Overfilling of the TSF impoundment and the spill over the dam crest may occur in case of: — receiving a surface runoff with 1% Annual Exceedance Probability; — failure of the stream diversion channel and interception channel (including timely snow clearing) and — uncontrolled filling of the TSF with simultaneous suspension of water withdrawal from it. • The likelihood of a hydrodynamic accident has been estimated to be minimal because the design provides for at least 1.5 m freeboard between the TSF filling level and the dam crest elevation.

Mayskoye TSF location and affected area in case of dam failure



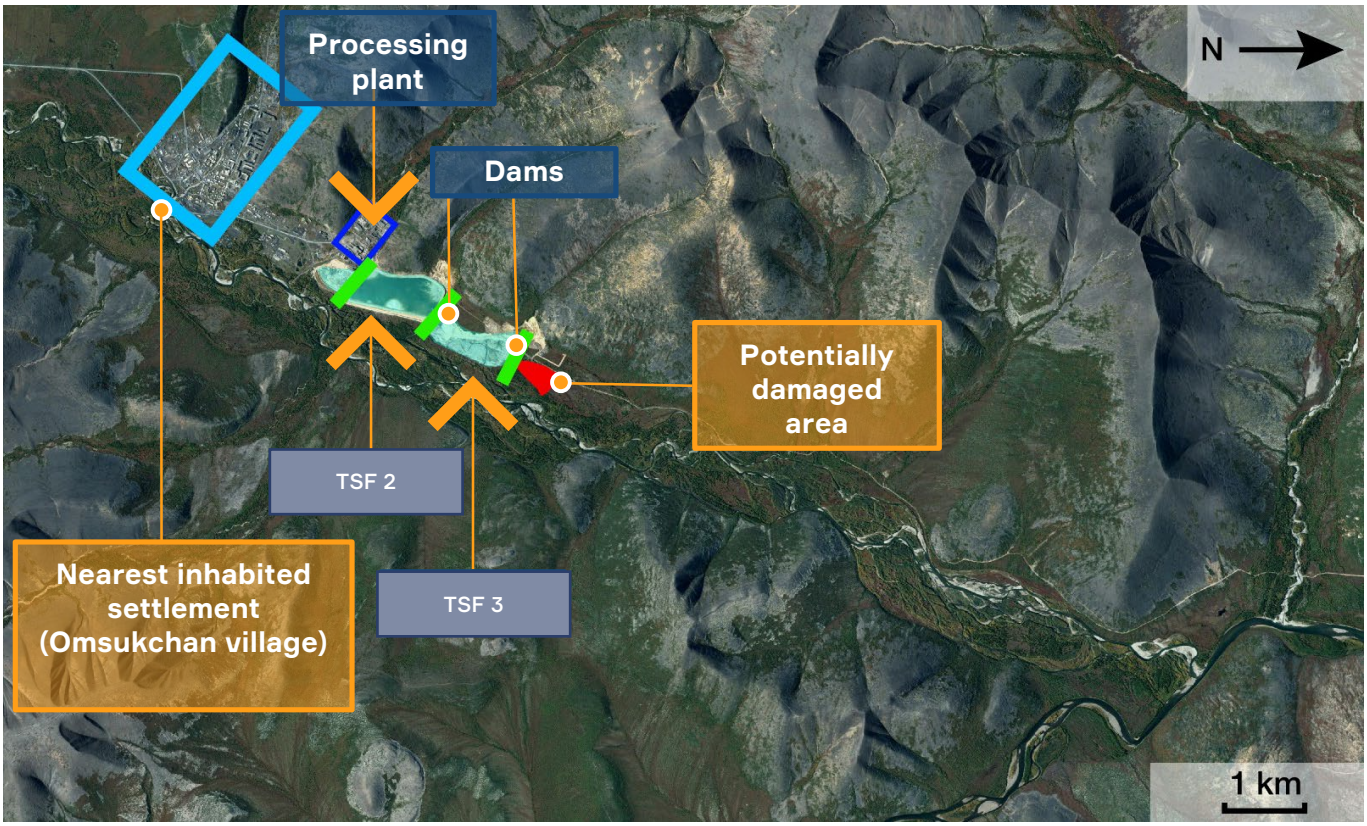
Omsukchan TSF 2

1	"Tailings Facility" Name/identifier	**Omsukchan TSF 2** **Key facts:** — ring-dyke type, — elevated by gradual raising towards upstream slope, each consecutive dam is partly placed on tailings and partly on the previous phase crest, — constructed using imported ground, — beach width has no limits, — water pressure on the dam is permitted, — raised in 3 phases.
2	Location	N 62°31′43″ E 155°49′12″
3	Ownership	Joint Stock Company "Magadan Silver" (JSC "Magadan Silver")
4	Status	Active
5	Date of initial operation	Commissioned by former owner — 1984. New launch in 2002 after acquisition by Polymetal's subsidiary (Magadan Silver) in 2000.
6	Is the Dam currently operated or closed as per currently approved design?	Operated as per currently approved design
7	Raising method	Elevated by gradual raising towards upstream slope, each consecutive dam is partly placed on tailings and partly on the previous phase crest.
8	Current Maximum Height	35 m
9	Current Tailings Storage Impoundment Volume	7,683,641 m^3
10	Planned Tailings Storage Impoundment Volume in 5 years' time	1.04.2019 — 31.12.2024: 1,501,071 m^3 Total by 2024: 9,184,712 m^3 * Figures have been estimated under the corporate long-term plan updated in 2019, adjusted with the filling coefficient.
11	Most recent Independent Expert Review	12.12.2016 — by inspection team (representatives of the company-operator, Russian Federal Environmental, Industrial and Nuclear Supervision Service (Rostechnadzor) and Ministry of Emergency Response) — as a check before issuing a permission paper and putting it in official register. 9.04.2018 — by JSC Russian Scientific and Research Institute named after B.E. Vedeneev.
12	Do you have full and complete relevant engineering records including design, construction, operation, maintenance, and/or closure?	• Tailings dam reconstruction project, ref. No 09 02 03 002 07.2008. • Tailings dam reconstruction project, ref. No 15-17(04)0061-00-GOR, including: — tailings dam monitoring project; — safety criteria; — potential damage estimation; — experts' review of the facility readiness to emergency consequences mitigation; — emergency response plan updated annually; — tailings dam operation procedures; — job description and occupational health and safety guidelines. • Experts' Review of the TSF safety declaration, ref. No 00-DB-0060-2017.

13	What is your hazard categorization of this facility, based on the consequence of failure?	• TSF category (depending on consequences of a potential hydrodynamic emergency) — IV, low hazard. — Number of permanent residents — none; — Living environment is not disturbed; — Harm to ecosystem is not significant with damage rehabilitation costs less than USD 1.7 m; — Potential failure would be within the land plot leased by the company. • TSF category depending on dam height and ground type — II, high hazard. • TSF category under Dam Safety Reference Book of CDA (CDA, 2014) — significant.
14	What guideline do you follow for the classification system?	Russian State Regulation No 986 of 02.11.2013 "On Hydraulic Structure Classification". Dam Safety Reference Book of CDA (CDA, 2014) — used for corporate purposes as a reference source.
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)?	The facility did not fail to be confirmed or certified as stable, or experience notable stability concerns. No risks affecting stability have been identified during the facility operation. Management efficiency is regularly estimated under the corporate "TSF Management System" and applicable legal requirements.
16	Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	During the construction stage we use designer supervision. During operation, we ensure internal control on the TSF condition under the corporate "TSF Management System". **There are several types of control checks:** **Scheduled:** **a)** Level 1 — carried out by an employee responsible for the TSF at the operation; **b)** Level 2 — carried out by other technical specialists at the operation; **c)** Level 3 — carried out by representatives of Polymetal Management Company (as consulting). **Unscheduled:** **a)** in case of a system processes review — initiated by the Company's Top Management (Group CEO, COO, managing director of the project); **b)** in case of multiple violations of legislative, regulatory and other requirements, applied to the TSF; **c)** in case of identifying adverse trends as a result of statistics analysis; **d)** in case of accidents (emergencies) affecting safety level at the TSF.
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?	Yes. Impact assessment of potential hazards for life, health and property in case of TSF failure was done by Promtechnologia LLC, Belgorod in 2018. It was then approved by local governmental authorities (Ministry of Natural Resources and Ecology in the Magadan region).
18	Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	**a)** There is a closure plan. A land reclamation section is included in the design documentation. **b)** As for now, the closure plan does not include long term monitoring. The program is a part of a Reclamation Project and will be developed in detail by the time of the TSF closure.
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?	There is a scenario of dam failure caused by an externality (natural disaster) in the potential damage estimation (clause 17): the emergency probability there is assessed as low.

20	Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.	• The dam is constructed using local crushed stone with 1.5 mm thick shield of HDPE geomembrane. Upstream slope is 1:3, general downstream slope is 1:2.2. • Drainage system is in place. A drainage system along dams is available to prevent seepage and includes pipe drains, drain headers, pump stations and cycled water pipelines, designated for the following purposes: — arranged diversion of seepage through the dam body and toe; — eliminating seepage inflow to the downstream slope and freezing zone; — improving the downstream slope stability. • The normative safety factor adjusted for this category of facility for solidity and consequences significance should be equal or more than 1.20. The safety factor calculated for the current TSF equals to 1.487. • The facility is officially in the Russian Register of Hydraulic Structures http://waterinfo.ru/gts/do_look.php?regnum=219440000726600 • We have a complete package of design documentation and permits on hand. • TSF is located in a region prone to earthquakes and has the potential to experience ground shaking levels of Intensity 7 (VII). • The probability of an earthquake magnitude 7 is 10% within the next 50 years, i.e. once every 500 years. • Seismic microregioning of the assessment of the impact of the local conditions on the seismic activity of the TSF area: — TSF bed — seismicity 7.51 and peak acceleration — 0.194 g, or 190 cm/s^2; — Enclosing dam — seismicity 7.08 and peak acceleration — 0.139 g, or 136 cm/s^2; — Adjacent massifs — seismicity 7.02 and peak acceleration — 0.133 g, or 131 cm/s^2. • The watershed area is 1,720 km^2. • The TSF is dyked (hydro-protected) by an interception channel, designed to hold maximum seasonal and rainfall flood flows with 0.1% annual exceedance probability, and by a stream diversion header that diverts the creek. • The area flooded in case of hydrodynamic accident at TSF No. 2 would be about 1.25 km^2. • Spill discharge volume is estimated at 900,000 m^3. • The area flooded in case of hydrodynamic accident TSF No. 3 would be about 1.5 km^2. • Spill discharge volume is estimated at 1,300,000 m^3. • Overfilling of the TSF impoundment and the spill over the dam crest may occur in case of: — receiving a surface runoff with 1% Annual Exceedance Probability, — failure of the stream diversion channel and interception channel (including timely snow clearing) and — uncontrolled filling of the TSF with simultaneous suspension of water withdrawal from it. • The likelihood of a hydrodynamic accident has been estimated to be minimal because the design provides for at least 1.5 m freeboard between the TSF filling level and the dam crest elevation.

Omsukchan TSF 2 location and affected area in case of dam failure



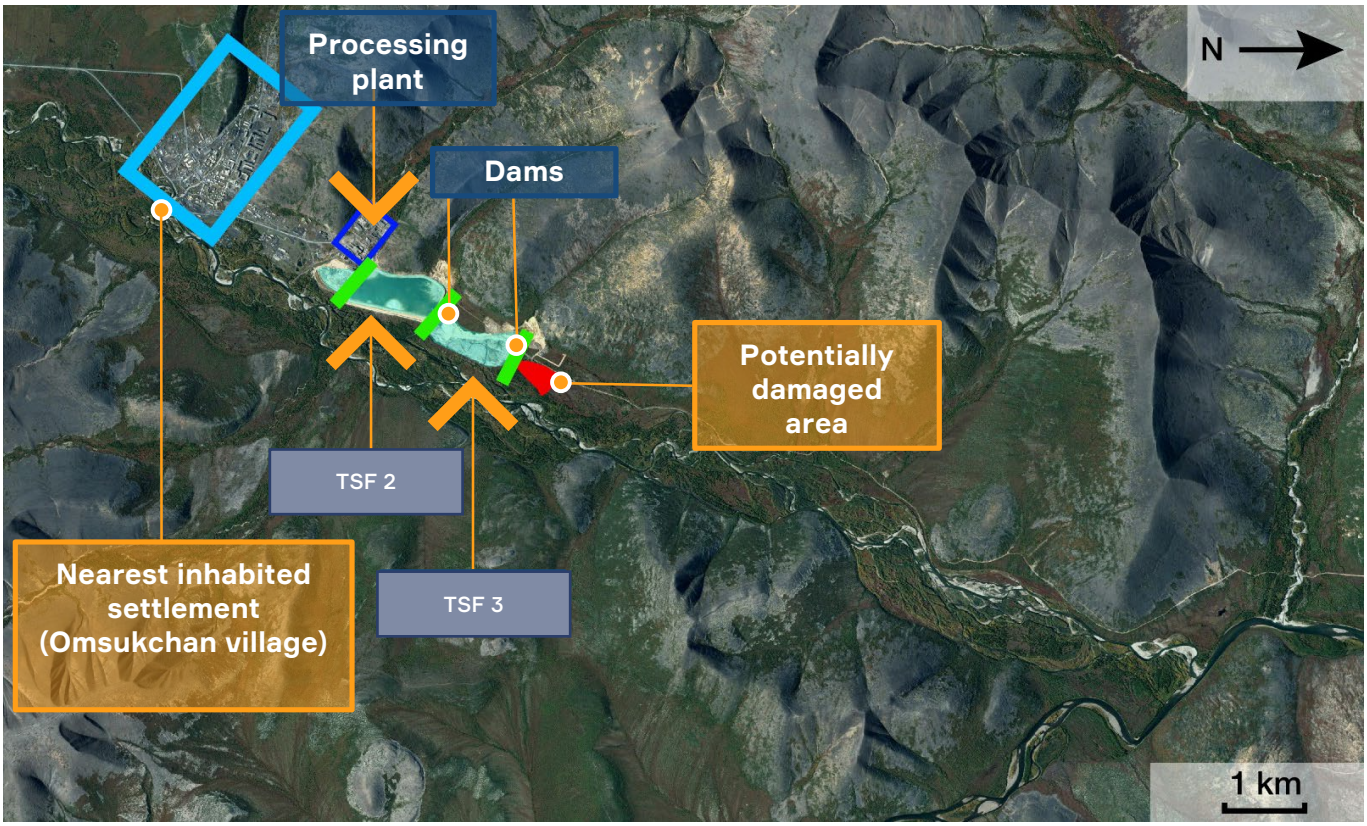
Omsukchan TSF 3

1	"Tailings Facility" Name/identifier	**Omsukchan TSF 3** **Key facts:** — elevated by gradual raising towards upstream slope, each consecutive dam is partly placed on tailings and partly on the previous phase crest, — ring-dyketype, — beach width is not regulated, — water pressure on the dam is permitted, — raised in 3 phases.
2	Location	N 62°32′24″ E 155°49′27″
3	Ownership	Joint Stock Company "Magadan Silver"
4	Status	Active
5	Date of initial operation	2007
6	Is the Dam currently operated or closed as per currently approved design?	Operated as per currently approved design
7	Raising method	Elevated by gradual raising towards upstream slope, each consecutive dam is partly placed on tailings and partly on the previous phase crest.
8	Current Maximum Height	27 m
9	Current Tailings Storage Impoundment Volume	7,391,925 m^3
10	Planned Tailings Storage Impoundment Volume in 5 years' time	1.04.2019 — 31.12.2024: 3,627,215 m^3 Total by 2024: 11,019,140 m^3 * Figures have been estimated under the corporate long-term plan updated in 2019, adjusted with the filling coefficient.
11	Most recent Independent Expert Review	28.11.2018 — Experts' Review on the TSF safety declaration after reconstruction, No 80 by LLC GTS Expert, St. Petersburg. 9.10.2018 by inspection team (representatives of the company-operator, Russian Federal Environmental, Industrial and Nuclear Supervision Service (Rostechnadzor) and Ministry of Emergency Response) — as a check before issuing a permission paper and putting it in official register. 9.04.2018 — Inspection of tailings dams No2 and No3 by JSC Russian Scientific and Research Institute named after B.E. Vedeneev.
12	Do you have full and complete relevant engineering records including design, construction, operation, maintenance, and/or closure?	• Tailings dam reconstruction project, ref. No 09 02 03 002 07, 2008. • Safety Declaration for tailings dam No2, ref. No 17-19(03)0007-22-GOR, including: — tailings dam monitoring project; — safety criteria; — potential damage estimation; — experts' review of the facility readiness to emergency consequences mitigation; — emergency response plan updated annually; — tailings dam operation procedures; — job description and occupational health and safety guidelines. • Experts' Review of the TSF safety declaration.

13	What is your hazard categorization of this facility, based on the consequence of failure?	• TSF category (depending on consequences of potential hydrodynamic emergency) — IV, low hazard. — Number of permanent residents — none. — Living environment is not disturbed. — Harm to ecosystem is not significant and damage rehabilitation costs less than USD 1.7 m. — Potential failure would be within the land plots leased to the company. • TSF category depending on dam height and ground type — II, high hazard • TSF category under Dam Safety Reference Book of CDA (CDA, 2014) — significant.
14	What guideline do you follow for the classification system?	Russian State Regulation No 986 of 2.11.2013 "On Hydraulic Structure Classification". Dam Safety Reference Book of CDA (CDA, 2014) — used for corporate purposes as a reference source.
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)?	The facility did not fail to be confirmed or certified as stable, or experience notable stability concerns. No risks affecting stability have been identified during the facility operation. Management efficiency is regularly estimated under the corporate "TSF Management System" and applicable legal requirements.
16	Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	During the construction stage we use designer supervision. During operation, we ensure internal control on the TSF condition under the corporate "TSF Management System". **There are several types of control checks:** **Scheduled:** **a)** Level 1 — carried out by an employee responsible for the TSF at the operation; **b)** Level 2 — carried out by other technical specialists at the operation; **c)** Level 3 — carried out by representatives of Polymetal Management Company (as consulting). **Unscheduled:** **a)** in case of system processes review — initiated by the Company's Top Management (Group CEO, COO, managing director of the project), **b)** in case of multiple violations of legislative, regulatory and other requirements, applied to the TSF, **c)** in case of identifying adverse trends as a result of statistics analysis, **d)** in case of accidents (emergencies) affecting safety level at the TSF.
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?	Impact assessment of potential hazards for life, health and property in case of TSF failure was done by Promtechnologia LLC, Belgorod in 2018. It was then approved by local governmental authorities (Ministry of Natural Resources and Ecology in the Magadan region).
18	Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	**a)** There is a closure plan. A land reclamation section is included in the design documentation. **b)** As for now, the closure plan does not include long term monitoring. The program is a part of a Reclamation Project and will be developed in detail by the time of the TSF closure.
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?	There is a scenario of dam failure caused by an externality (natural disaster) in the potential damage estimation (clause 17): the emergency probability there is assessed as low.

20	Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.	• The dam is constructed using local crushed stone with 1.5 mm thick shield of HDPE geomembrane. Upstream slope is 1:3, general downstream slope is 1:2.2. • Drainage system is in place. A drainage system along dams is available to prevent seepage and includes pipe drains, drain headers, pump stations and cycled water pipelines, designated for the following purposes: — arranged diversion of seepage through the dam body and toe; — eliminating seepage inflow to the downstream slope and freezing zone; — improving the downstream slope stability. • The normative safety factor adjusted for this category of facility for solidity and consequences significance should be equal or more than 1.20. The safety factor calculated for the current TSF equals 1.557. • The facility is officially in the Russian Register of Hydraulic Structures http://waterinfo.ru/gts/do_look.php?regnum=219440000726600 • We have a complete package of design documentation and permits on hand. • The watershed area is 3.191 км^2. • The TSF is dyked (hydro-protected) by a stream diversion channel, designed to hold maximum seasonal and rainfall flood flows with 0.1% annual exceedance probability. • Luna TSF is located in the areas with seismic levels of 7 and 8. • TSF is located in a region prone to earthquakes and has the potential to experience ground shaking levels of Intensity 7 (VII) to 8 (VIII). • The probability of an earthquake magnitude 7 is 10% within the next 50 years, i.e. once every 500 years, and the probability of an earthquake magnitude 8 is 1% within the next 50 years, i.e. once every 5000 years. • Seismic microregioning of the assessment of the impact of the local conditions on the seismic activity of the TSF area: — TSF bed — seismicity 7.32 and peak acceleration — 0.167 g, or 164.0 cm/s^2; — Enclosing dam — seismicity 6.79 and peak acceleration — 0.111 g or 109.0 cm/s^2; — Adjacent massifs — seismicity 6.74 and peak acceleration — 0.108 g, or 106.0 cm/s^2. • The area flooded in case of hydrodynamic accident at TSF No. 2 would be about 1.5 km^2. • Spill discharge volume is estimated at 973,000 m^3. • Overfilling of the TSF impoundment and the spill over the dam crest may occur in case of: — receiving a surface runoff with 1% Annual Exceedance Probability, — failure of the stream diversion channel and interception channel (including timely snow clearing) and — uncontrolled filling of the TSF with simultaneous suspension of water withdrawal from it. • The likelihood of a hydrodynamic accident has been estimated to be minimal because the design provides for at least 1.5 m freeboard between the TSF filling level and the dam crest elevation.

Omsukchan TSF 3 location and affected area in case of dam failure



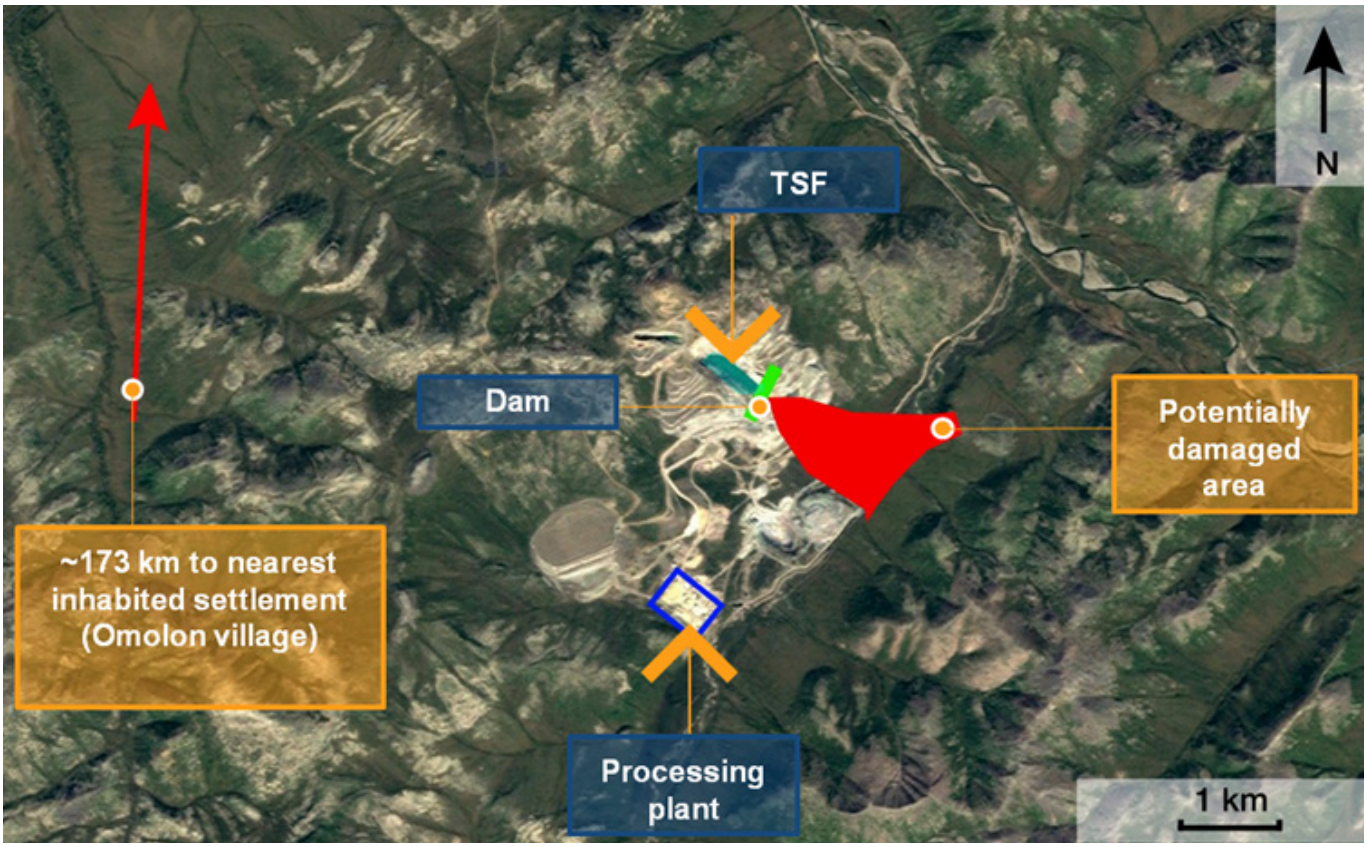
Omolon TSF

1	"Tailings Facility" Name/identifier	**Omolon TSF** **Key facts:** — upstream (elevated by gradual raising towards upstream slope), — located in depleted open pit mine, — beach width is not regulated, — water pressure on the dam is permitted, — raised in 3 phases, — phase 1 dam is settled on the pit wall, two subsequent phases are placed partly on tailings and partly on the dam crest from previous phase.
2	Location	N 63°41′16″ E 159°59′13″
3	Ownership	Limited Liability Company "Omolon Gold Mining Company"
4	Status	Active
5	Date of initial operation	2010
6	Is the Dam currently operated or closed as per currently approved design?	Operated as per currently approved design
7	Raising method	Elevated by gradual raising towards upstream slope. Phase 1 dam is placed on the pit wall, two subsequent phases are placed partly on tailings and partly on the dam crest from previous phase.
8	Current Maximum Height	28 m
9	Current Tailings Storage Impoundment Volume	5,850,000 m^3
10	Planned Tailings Storage Impoundment Volume in 5 years' time	Starting from 2023, the tailing storage will be replaced withdry stacking. 1.04.2019 — 31.12.2022: 1,804,000 m^3 Total by 2024: 7,654,000 m^3 * Figures have been estimated under the corporate long-term plan updated in 2019, adjusted with the filling coefficient.
11	Most recent Independent Expert Review	2018 — by inspection team (representatives of the company-operator, Russian Federal Environmental, Industrial and Nuclear Supervision Service (Rostechnadzor) and Ministry of Emergency Response) — as a check before issuing a permission paper and putting it in official register. Confirmatory calculation of the dam stability and stress-strain state at Glavnoye tailings dam of the Kubaka process plant, considering infiltration and temperature profile, Promtechnologya, 2018. 20.03.2019 — Experts' Review on the TSF safety declaration — tailings dam expansion at Kubaka process plant within mined out Glavny open pit. GTS Expert LLC, St. Petersburg

12	Do you have full and complete relevant engineering records including design, construction, operation, maintenance, and/or closure?	• Design documentation "Tailings dam expansion at Kubaka process plant within mined out Glavny open pit". • Positive review of Federal Autonomous Organization Main State Expertise, No1144-12_GGE-8315_15 of 7.12.12. • Safety Declaration ref. No 119-19(02)000-22-ГОР approved on 20.03.2019 including: — tailings dam monitoring project; — safety criteria; — potential damage estimation; — experts' review of the facility readiness to emergency consequences mitigation; — emergency response plan updated annually; — tailings dam operation procedures; — job description and occupational health and safety guidelines.
13	What is your hazard categorization of this facility, based on the consequence of failure?	• TSF category (depending on consequences of potential hydrodynamic emergency) — IV, low hazard. — Number of permanent residents — none. — Living environment is not disturbed. — Harm to ecosystem is not significant and damage rehabilitation costs less than USD 1.7 m. — Potential failure would be within the land plots leased to the company. — 2 service employees could be trapped within the impact area. — TSF category depending on dam height and ground type — II, high hazard. • TSF category under Dam Safety Reference Book of CDA (CDA, 2014) — significant.
14	What guideline do you follow for the classification system?	Russian State Regulation No 986 of 2.11.2013 "On Hydraulic Structure Classification". Dam Safety Reference Book of CDA (CDA, 2014) — used for corporate purposes as a reference source.
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)?	The facility did not fail to be confirmed or certified as stable, or experience notable stability concerns. No risks affecting stability have been identified during the facility operation. Management efficiency is regularly estimated under the corporate "TSF Management System" and applicable legal requirements.
16	Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	During the construction stage we use designer supervision. During operation, we ensure internal control on the TSF condition under the corporate "TSF Management System". **There are several types of control checks:** **Scheduled:** **a)** Level 1 — carried out by an employee responsible for the TSF at the operation; **b)** Level 2 — carried out by other technical specialists at the operation; **c)** Level 3 — carried out by representatives of Polymetal Management Company (as consulting). **Unscheduled:** **a)** in case of system processes review — initiated by the Company's Top Management (Group CEO, COO, managing director of the project); **b)** in case of multiple violations of legislative, regulatory and other requirements, applied to the TSF; **c)** in case of identifying adverse trends as a result of statistics analysis; **d)** in case of accidents (emergencies) affecting safety level at the TSF.

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?	Yes. Impact assessment of potential hazards for life, health and property in case of TSF failure was done by Promtechnologia LLC, Belgorod in 2018. It was then approved by local governmental authorities (Ministry of Natural Resources and Ecology in the Magadan region).
18	Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	a) There is a closure plan. A land reclamation section is included in the design documentation. b) As for now, the closure plan does not include long term monitoring. The program is a part of a Reclamation Project and will be developed in detail by the time of the TSF closure.
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?	There is a scenario of dam failure caused by an externality (natural disaster) in the potential damage estimation (clause 17): the emergency probability there is assessed as low.
20	Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.	• The dam is constructed using local crushed stone, dam will be built in 3 phases, total height of 3 phases is 35 m. • Impermeable screen made of geomembrane is laid on the dam crest and pipe drains are provided within the downstream slope. • Upstream slope is 1:3, general downstream slope is 1:2.3. • A drainage system along dams is available to prevent seepage and includes pipe drains, drain headers, pump stations and cycled water pipelines. • Normative safety factor adjusted for this category of facility for solidity and consequences significance should be equal or more than 1.20. • Safety factor calculated for the current TSF equals 1.22. • The facility is officially in the Russian Register of Hydraulic Structures http://waterinfo.ru/gts/do_look.php?regnum=219440000489500 • We have a complete package of design documentation and permits on hand. • TSF is located in a region prone to earthquakes and has the potential to experience ground shaking levels of Intensity 7 (VII). • The watershed area is 140 км^2. The creeks flood plain elevations in the TSF section are below the pit edge and the TSF dam. No water diversion structures are provided. The sediments in the TSF area are accumulated in the settling pond and are included into the water balance. • The area flooded in case of hydrodynamic accident would be 0.04 km^2. • Spill discharge volume is estimated at 627,112 m^3. • Overfilling of the TSF impoundment and the spill over the dam crest may occur in case of: — receiving a surface runoff with 1% Annual Exceedance Probability, — failure of the stream diversion channel and interception channel (including timely snow clearing) and — uncontrolled filling of the TSF with simultaneous suspension of water withdrawal from it. • The likelihood of a hydrodynamic accident has been estimated to be minimal because the design provides for at least 1.5 m freeboard between the TSF filling level and the dam crest elevation.

Omolon TSF location and affected area in case of dam failure



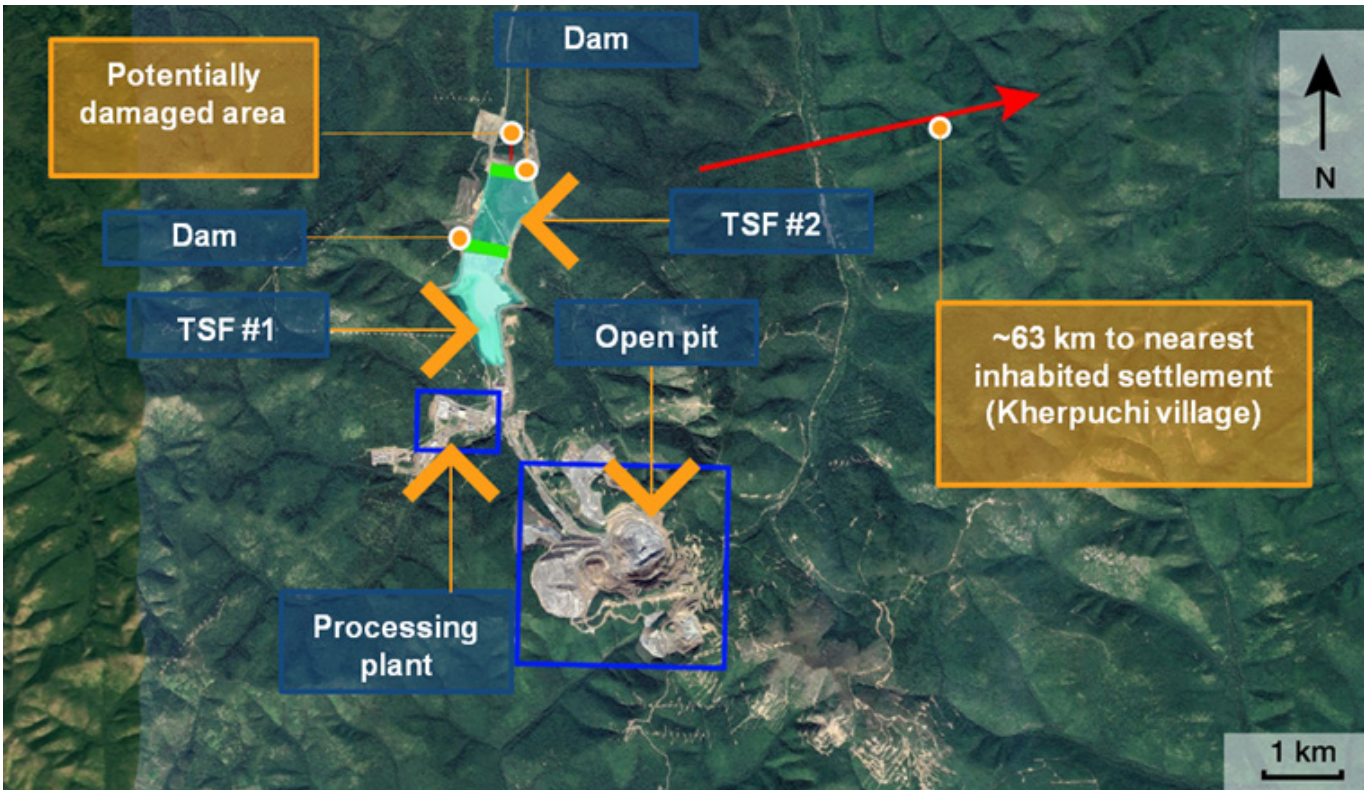
Albazino TSF 1

1	"Tailings Facility" Name/identifier	**Albazino TSF 1** **Key facts:** — upstream (elevated by gradual raising towards upstream slope, each consecutive dam is partly placed on tailings and partly on the previous phase crest), — valley-fill type, — beach width is not regulated, — water pressure on the dam is permitted, — raised in 3 phases.
2	Location	N 52°52′45″ E 137°54′05″
3	Ownership	Albazino Resources Ltd.
4	Status	Active
5	Date of initial operation	2011
6	Is the Dam currently operated or closed as per currently approved design?	Operated as per currently approved design
7	Raising method	Elevated by gradual raising towards upstream slope, each consecutive dam is partly placed on tailings and partly on the previous phase crest.
8	Current Maximum Height	26 m
9	Current Tailings Storage Impoundment Volume	8,250,000 m^3
10	Planned Tailings Storage Impoundment Volume in 5 years' time	TSF is full. No further storage is intended. * Figures have been estimated under the corporate long-term plan updated in 2019, adjusted with the filling coefficient.
11	Most recent Independent Expert Review	2016 — by inspection team (representatives of the company-operator, Russian Federal Environmental, Industrial and Nuclear Supervision Service (Rostechnadzor) and Ministry of Emergency Response) — as a check before issuing a permission paper and putting it in official register. 2014 — Technical report "Strength study of tailings samples from the beach of phase 2 at tailings dam No1 of the Albazino mine and process plant and stability estimation for the dam of phase 3 at tailings dam No1 considering the results of the tailings sample strength study" by JSC Russian Research Institute named after B.E. Vedeneev.
12	Do you have full and complete relevant engineering records including design, construction, operation, maintenance, and/or closure?	• Project of the Albazino mine and process plant construction, 2009. • Safety Declaration for tailings dam No1, phase 3, reg. No 17-17(03)0050-00-GOR, including: — tailings dam monitoring project; — safety criteria; — potential damage estimation; — experts' review of the facility readiness to emergency consequences mitigation; — emergency response plan updated annually; — tailings dam operation procedures; — job description and occupational health and safety guidelines.

13	What is your hazard categorization of this facility, based on the consequence of failure?	• TSF category (depending on consequences of potential hydrodynamic emergency) — IV, low hazard. — Number of permanent residents — none. — Living environment is not disturbed. — Harm to ecosystem is not significant and damage rehabilitation costs less than USD 1.7 m. — Potential failure would be within the land plots leased to the company. • TSF category depending on dam height and ground type — II, high hazard. • TSF category under Dam Safety Reference Book of CDA (CDA, 2014) — significant.
14	What guideline do you follow for the classification system?	Russian State Regulation No 986 of 2.11.2013 "On Hydraulic Structure Classification". Dam Safety Reference Book of CDA (CDA, 2014) — used for corporate purposes as a reference source.
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)?	The facility did not fail to be confirmed or certified as stable, or experience notable stability concerns. No risks affecting stability have been identified during the facility operation. Management efficiency is regularly estimated under the corporate "TSF Management System" and applicable legal requirements.
16	Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	During the construction stage we use designer supervision. During operation, we ensure internal control on the TSF condition under the corporate "TSF Management System". **There are several types of control checks:** **Scheduled:** **a)** Level 1 — carried out by an employee responsible for the TSF at the operation; **b)** Level 2 — carried out by other technical specialists at the operation; **c)** Level 3 — carried out by representatives of Polymetal Management Company (as consulting). **Unscheduled:** **a)** in case of system processes review — initiated by the Company's Top Management (Group CEO, COO, managing director of the project); **b)** in case of multiple violations of legislative, regulatory and other requirements, applied to the TSF; **c)** in case of identifying adverse trends as a result of statistics analysis; **d)** in case of accidents (emergencies) affecting safety level at the TSF.
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?	Yes. Impact assessment of potential hazards for life, health and property in case of TSF failure was done by LLC Scientific and Research Centre Spetspromgidrotek, Moscow in 2017. It was then approved by local governmental authorities.
18	Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	**a)** There is a closure plan. A land reclamation section is included in the design documentation. **b)** As for now, the closure plan does not include long term monitoring. The program is a part of a Reclamation Project and will be developed in detail by the time of the TSF closure.
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?	There is a scenario of dam failure caused by an externality (natural disaster) in the potential damage estimation (clause 17): the emergency probability there is assessed as low.

20	Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.	• The dam is constructed using local crushed stone, dam will be elevated in 3 phases. • The dam is constructed using local crushed stone with 1.5 mm thick shield of HDPE geomembrane. • Upstream slope is 1:3, general downstream slope is 1:2.5. • A drainage system along dams is available to prevent seepage and includes pipe drains, drain headers, pump stations and cycled water pipelines. • The normative safety factor adjusted for this category of facility for solidity and consequences significance should be equal or more than 1.20. • The safety factor calculated for the current TSF equals to 1.32. • The facility is officially in the Russian Register of Hydraulic Structures http://waterinfo.ru/gts/do_look.php?regnum=220080000283900 • We have a complete package of design documentation and permits on hand. • TSF is located in a region prone to earthquakes and has the potential to experience ground shaking levels of Intensity 7 (VII). • The watershed area is 1.578 km^2. • The TSF is dyked (hydro-protected) by stream diversion channels, designed to hold maximum seasonal and rainfall flood flows with 0.1% annual exceedance probability. • The area flooded in case of hydrodynamic accident would be 0.02 km^2. • Spill discharge volume is estimated at 70,590 m^3. • Overfilling of the TSF impoundment and the spill over the dam crest may occur in case of: — receiving a surface runoff with 1% Annual Exceedance Probability, — failure of the stream diversion channel and interception channel (including timely snow clearing) and — uncontrolled filling of the TSF with simultaneous suspension of water withdrawal from it. • The likelihood of a hydrodynamic accident has been estimated to be minimal because the design provides for at least 1.5 m freeboard between the TSF filling level and the dam crest elevation.

Albazino TSF 1 location and affected area in case of dam failure



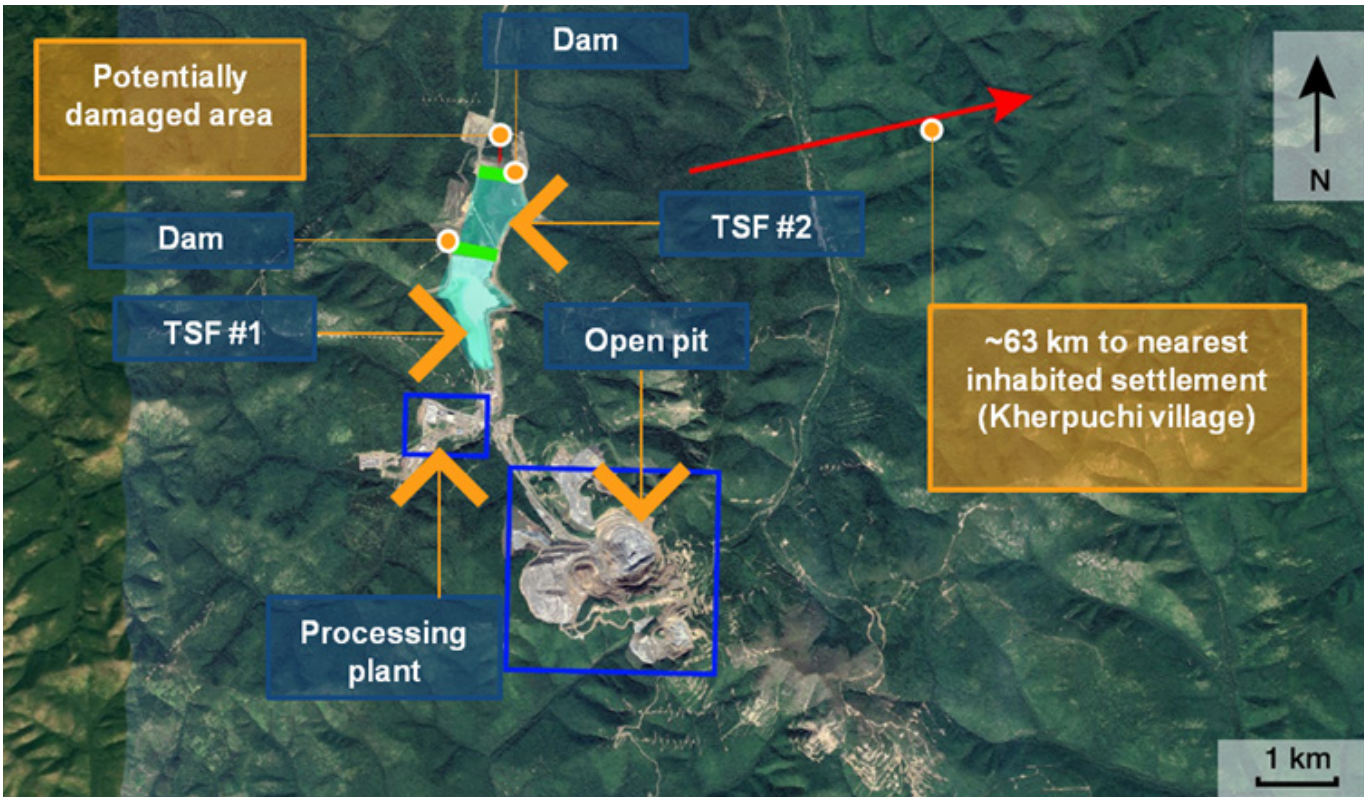
Albazino TSF 2

1	"Tailings Facility" Name/identifier	**Albazino TSF 2** **Key facts:** — upstream (elevated by gradual raising towards upstream slope, each consecutive dam is partly placed on tailings and partly on the previous phase crest), — valley-fill type, — beach width is not regulated, — water pressure on the dam is permitted, — raised in 3 phases.
2	Location	N52°53′24″ E137°54′22″
3	Ownership	Albazino Resources Ltd.
4	Status	Active
5	Date of initial operation	2018
6	Is the Dam currently operated or closed as per currently approved design?	Operated as per currently approved design
7	Raising method	Elevated by gradual raising towards upstream slope, each consecutive dam is partly placed on tailings and partly on the previous phase crest.
8	Current Maximum Height	24 m
9	Current Tailings Storage Impoundment Volume	920,000 m^3
10	Planned Tailings Storage Impoundment Volume in 5 years' time	1.04.2019 — 31.12.2024: 5,600,000 m^3 Total by 2024: 6,520,000 m^3 * Figures have been estimated under the corporate long-term plan updated in 2019, adjusted with the filling coefficient.
11	Most recent Independent Expert Review	2018 — by inspection team (representatives of the company-operator, Russian Federal Environmental, Industrial and Nuclear Supervision Service (Rostechnadzor) and Ministry of Emergency Response) — as a check before issuing a permission paper and putting it in official register.
12	Do you have full and complete relevant engineering records including design, construction, operation, maintenance, and/or closure?	• Tailings dam project, ref. No 17 01 03 072 03.2015. • Safety declaration for TSF No2. ref. No 18-18(00)0080-00-GOR, including: — tailings dam monitoring project; — safety criteria; — potential damage estimation; — experts' review of the facility readiness to emergency consequences mitigation; — emergency response plan updated annually; — tailings dam operation procedures; — job description and occupational health and safety guidelines. • Experts' Review of hydraulic structure safety declaration.

13	What is your hazard categorization of this facility, based on the consequence of failure?	• TSF category (depending on consequences of potential hydrodynamic emergency) — IV, low hazard. — Number of permanent residents — none. — Living environment is not disturbed. — Harm to ecosystem is not significant and damage rehabilitation costs less than USD 1.7 m. — Potential failure would be within the land plots leased to the company. • TSF category depending on dam height and ground type — II, high hazard. • TSF category under Dam Safety Reference Book of CDA (CDA, 2014) — significant.
14	What guideline do you follow for the classification system?	Russian State Regulation No 986 of 2.11.2013 "On Hydraulic Structure Classification". Dam Safety Reference Book of CDA (CDA, 2014) — used for corporate purposes as a reference source.
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)?	The facility did not fail to be confirmed or certified as stable, or experience notable stability concerns. No risks affecting stability have been identified during the facility operation. Management efficiency is regularly estimated under the corporate "TSF Management System" and applicable legal requirements.
16	Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	During the construction stage we use designer supervision. During operation, we ensure internal control on the TSF condition under the corporate "TSF Management System". **There are several types of control checks:** **Scheduled:** **a)** Level 1 — carried out by an employee responsible for the TSF at the operation; **b)** Level 2 — carried out by other technical specialists at the operation; **c)** Level 3 — carried out by representatives of Polymetal Management Company (as consulting). **Unscheduled:** **a)** in case of system processes review — initiated by the Company's Top Management (Group CEO, COO, managing director of the project); **b)** in case of multiple violations of legislative, regulatory and other requirements, applied to the TSF; **c)** in case of identifying adverse trends as a result of statistics analysis; **d)** in case of accidents (emergencies) affecting safety level at the TSF.
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?	Yes. Impact assessment of potential hazards for life, health and property in case of TSF failure was done by LLC Scientific and Research Centre Spetspromgidrotek, Moscow in 2018. It was then approved by local governmental authorities.
18	Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	**a)** There is a closure plan. A land reclamation section is a part of design documentation. **b)** As for now, the closure plan does not include long term monitoring. The program is a part of a Reclamation Project and will be developed in detail by the time of the TSF closure.
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?	There is a scenario of dam failure caused by an externality (natural disaster) in the potential damage estimation (clause 17): the emergency probability there is assessed as low.

20	Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.	• The dam is constructed using local crushed stone, dam will be built in 3 phases: Phase 1 with a height of 24 m is raised on natural ground base. Phases 2 and 3 with a height of 5 m each are partly placed on tailings and partly on the previous phase crest. • The dam is constructed using local crushed stone with 1.5 mm thick shield of HDPE geomembrane. • Upstream slope is 1:3, general downstream slope is 1:2.2. • A drainage system along dams is available to prevent seepage and includes pipe drains, drain headers, pump stations and cycled water pipelines. • Normative safety factor adjusted for this category of facility for solidity and consequences significance should be equal or more than 1.20. • Safety factor calculated for the current TSF equals 1.35. • We have a complete package of design documentation and permits on hand. • TSF is located in a region prone to earthquakes and has the potential to experience ground shaking levels of Intensity 7 (VII). • The watershed area is 0.93 km^2. • The area flooded in case of hydrodynamic accident would be 0.25 km^2. • Spill discharge volume is estimated at 222,434 m^3. • The TSF is dyked (hydro-protected) by stream diversion channels, designed to hold maximum seasonal and rainfall flood flows with 0.1% annual exceedance probability. • Overfilling of the TSF impoundment and the spill over the dam crest may occur in case of: — receiving a surface runoff with 1% Annual Exceedance Probability, — failure of the stream diversion channel and interception channel (including timely snow clearing) and — uncontrolled filling of the TSF with simultaneous suspension of water withdrawal from it. • The likelihood of a hydrodynamic accident has been estimated to be minimal because the design provides for at least 1.5 m freeboard between the TSF filling level and the dam crest elevation.

Albazino TSF 2 location and affected area in case of dam failure



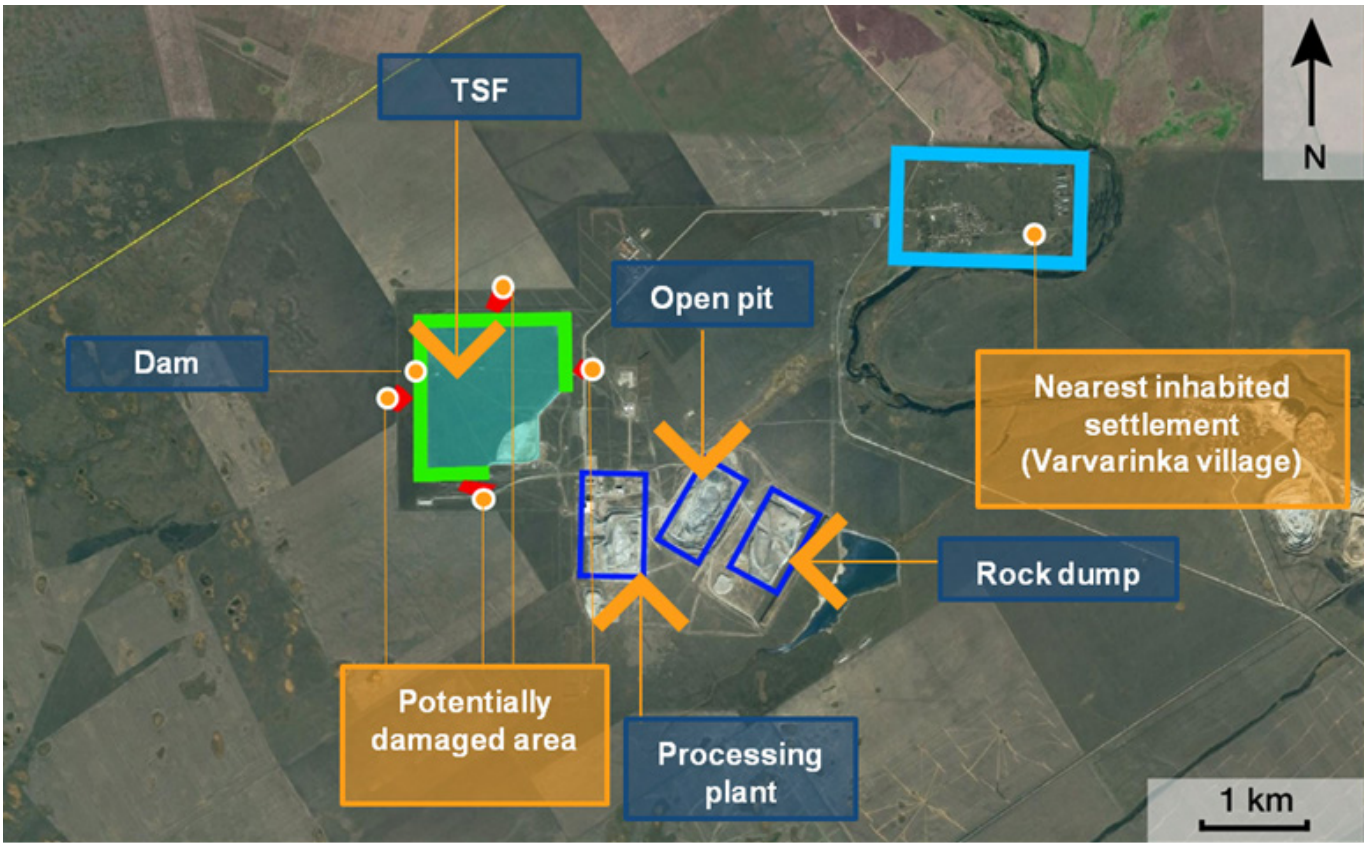
Varvara TSF

1	"Tailings Facility" Name/identifier	**Varvara TSF** **Key facts:** — upstream dam construction, — ring-dyke type, — made of local ground, — raised in 6 phases.
2	Location	N 52°56′06″ — 52°58′04″ E 62°08′56″— 62°10′47″
3	Ownership	JSC Varvarinskoye
4	Status	Active
5	Date of initial operation	2007
6	Is the Dam currently operated or closed as per currently approved design?	Operated as per currently approved design
7	Raising method	Until 2017, 4 phases with a total height of 18m were constructed, each dam was raised partly on previously placed tailings and partly on crest of the dam which was constructed during previous phase. Starting from 2017, the dam is has been raised on downstream slope.
8	Current Maximum Height	22 m
9	Current Tailings Storage Impoundment Volume	25,603,899 m^3
10	Planned Tailings Storage Impoundment Volume in 5 years' time	1.04.2019 — 31.12.2024: 12,758,620 m^3 Total by 2024 : 38,362,519 m^3 * Figures have been estimated under the corporate long-term plan updated in 2019, adjusted with the filling coefficient.
11	Most recent Independent Expert Review	2019 — Inspection of tailings storage engineering condition, Government supervision authorities. 2016 — report on the tailings storage audit results by SRK.
12	Do you have full and complete relevant engineering records including design, construction, operation, maintenance, and/or closure?	Design project by State Scientific and Production Association of Industrial Ecology KAZMECHANOBR, 2004. Operation project of TSF phases 5 and 6 by Projecttechstroy, 2018. Detailed working documents — technical procedures of the TSF, 2017.
13	What is your hazard categorization of this facility, based on the consequence of failure?	• TSF category (responsibility level): I — high. — Number of permanent residents — none. — Living environment is not disturbed. — Harm to ecosystem is not significant and damage rehabilitation costs less than USD 1.7 m. — Potential failure would be within the land plots leased to the company. • TSF category depending on dam height and ground type — IV. • TSF category under Dam Safety Reference Book of CDA (CDA, 2014) — significant.

14	What guideline do you follow for the classification system?	Construction standards and regulations of Kazakhstan 3.04-01-2013, Appendix 2. Kazakhstan Construction Regulation 1.02-04-2013 "Classification of Construction Facilities and Urban Development Areas Based on Levels of Responsibility". Recommendations on design and construction of sludge collectors and tailings dams in metallurgical industry, paragraph 3.25, Table 1. Dam Safety Reference Book of CDA (CDA, 2014) — used for corporate purposes as a reference source.
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)?	Yes. A significant embankment failure occurred to the north of the facility on 14.09.2016 with neither negative consequences nor damage. All responsive measures were taken according to the emergency plan, the dam was remediated. The dam was surcharged with a rock fill buttress against starter embankment.
16	Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	During the construction stage we use designer supervision. During operation, we ensure internal control on the TSF condition under the corporate "TSF Management System". **There are several types of control checks:** **Scheduled:** **a)** Level 1 — carried out by an employee responsible for the TSF at the operation; **b)** Level 2 — carried out by other technical specialists at the operation; **c)** Level 3 — carried out by representatives of Polymetal Management Company (as consulting). **Unscheduled:** **a)** in case of system processes review — initiated by the Company's Top Management (Group CEO, COO, managing director of the project); **b)** in case of multiple violations of legislative, regulatory and other requirements, applied to the TSF; **c)** in case of identifying adverse trends as a result of statistics analysis; **d)** in case of accidents (emergencies) affecting safety level at the TSF.
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?	In 2018, Projecttechstroy PLC issued a report "Estimation and analysis with the purpose of determining consequences caused by damage of enclosure and spillway facilities, boundary of possible flood zone, contamination of groundwater and surface watercourses in case of hydrodynamic accident at the tailings dam of Varvara processing plant."
18	Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	**a)** No. **b)** No. Reclamation Program will be developed in details by the time of the TSF closure.
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?	There is a scenario of dam failure caused by an externality (natural disaster) in the potential damage estimation (clause 17): the emergency probability there is assessed as low.

20	Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.	• The dam is constructed under the design project 2004. Dam of Phase 1 (starter dam) is filled around the entire perimeter at a height from 5.0 m to 7.0 m and 1:2.5 slope. Secondary dams (phases) are built from local construction materials (loam) and placed on deposited tailings in the direction of the upstream slope and have a height of 3m each. • A reconstruction project was completed in 2017: the dam is raised on the downstream slope with rock in two phases. At Phase 5 the dam crest width is 11.0 m, upstream slope — 1:3, downstream slope — 1:1.5. A 12.0 m wide berm is arranged on the downstream slope. Raising is carried out in two phases. • The dam is constructed with a thick shield of geomembrane. • A drainage system along dams is available to prevent seepage and includes pipe drains, drain headers, pump stations and cycled water pipelines. • The normative safety factor adjusted for this category of facility for solidity and consequences significance should be equal or more than 1.20. • Safety factor calculated for the current TSF equals 1.205. • We have a complete package of design documentation and permits on hand. • TSF is located in a region prone to earthquakes and has the potential to experience ground shaking levels of Intensity 6 (VI). • The watershed area is 1.96 km^2. • The creeks flood plain elevations in the TSF section are below the elevations of the pit edge, in which the TSF is located. No water diversion structures are provided. The sediments in the TSF area are accumulated in the settling pond and are included into the water balance. • The area flooded in case of hydrodynamic accident would be 0.02 km^2. • Spill discharge volume is estimated at 1,404 m^3. • Overfilling of the TSF impoundment and the spill over the dam crest may occur in case of: — receiving a surface runoff with 1% Annual Exceedance Probability, — ailure of the stream diversion channel and interception channel (including timely snow clearing) and — uncontrolled filling of the TSF with simultaneous suspension of water withdrawal from it. • The likelihood of a hydrodynamic accident has been estimated to be minimal because the design provides for at least 1.5 m freeboard between the TSF filling level and the dam crest elevation.

Varvara TSF location and affected area in case of dam failure



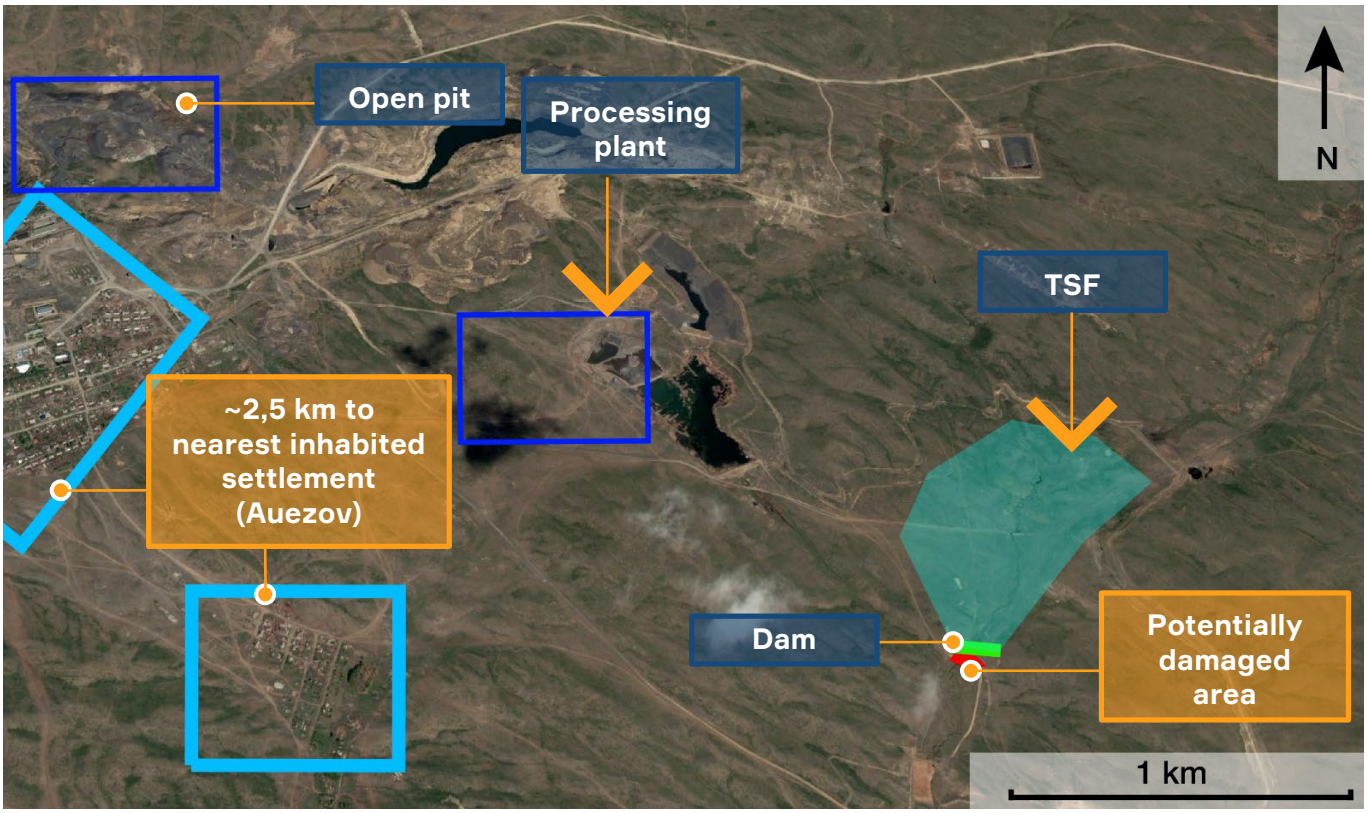
Kyzyl TSF

1	"Tailings Facility" Name/identifier	**Kyzyl TSF** **Key facts:** — downstream construction, — valley-fill type, — beach width is not regulated, — water pressure on the dam is permitted, — TSF is formed by three dams and a hill slope on the fourth side.
2	Location	N 81°37′41″ E 49°42′10″
3	Ownership	Bakyrchik Mining Venture LLC
4	Status	Active
5	Date of initial operation	2018
6	Is the Dam currently operated or closed as per currently approved design?	Operated as per currently approved design
7	Raising method	Downstream. Dam No 1 is raised during 4th phase on the downstream slope. Dams No 2, 3 are raised to full height.
8	Current Maximum Height	20 m
9	Current Tailings Storage Impoundment Volume	929,254 m^3
10	Planned Tailings Storage Impoundment Volume in 5 years' time	1.04.2019 — 31.12.2024: 8,624,413 m^3 Total by 2024: 9,553,668 m^3 * Figures have been estimated under the corporate long-term plan updated in 2019, adjusted with the filling coefficient.
11	Most recent Independent Expert Review	28.11.2018 — Experts' review No72-18 on compliance of "Bakyrchik Mining Venture's industrial safety declaration for hazardous facilities" with the requirements of industrial safety regulatory documents applicable in the Republic of Kazakhstan. 3.11.2016 — State Environmental Expert Review No F01-0039/16.
12	Do you have full and complete relevant engineering records including design, construction, operation, maintenance, and/or closure?	• Design project: TSF for storing tailings of sulphide ore flotation and carbon-bearing product of the process plant of Bakyrchik mining venture LLC, including Environmental Impact Assessment (Kazakhstan Design and Engineering Centre "Littera 3", Oskemen, 2016). • Operation project: TSF for storing tailings of sulphide ore flotation and carbon-bearing product of the process plant of Bakyrchik mining venture LLC (Projecttechstroy, Oskemen, 2017). • Detailed working documents. • Industrial safety declaration for hazardous industrial facility of the Bakyrchik mining venture LLC (the city of Semey, 2018). • Industrial safety declaration for the TSF for storing tailings of sulphide ore flotation and carbon-bearing product of the process plant of Bakyrchik mining venture LLC (Oskemen, 2016).

13	What is your hazard categorization of this facility, based on the consequence of failure?	• TSF category (responsibility level): I — high. — Number of permanent residents — none. — Living environment is not disturbed. — Harm to ecosystem is not significant and damage rehabilitation costs less than USD 1.7 m. — Potential failure would be within the land plots leased to the company. • TSF category depending on dam height and ground type — IV. • TSF category under Dam Safety Reference Book of CDA (CDA, 2014) — significant.
14	What guideline do you follow for the classification system?	Construction standards and regulations of Kazakhstan 3.04-01-2013, Appendix 2. Kazakhstan Construction Regulation 1.02-04-2013 "Classification of Construction Facilities and Urban Development Areas Based on Levels of Responsibility". Recommendations on design and construction of sludge collectors and tailings dams in metallurgical industry, paragraph 3.25, Table 1. Dam Safety Reference Book of CDA (CDA, 2014) — used for corporate purposes as a reference source.
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)?	The facility did not fail to be confirmed or certified as stable, or experienced notable stability concerns. No risks affecting stability have been identified during the facility operation. Management efficiency is regularly estimated under the corporate "TSF Management System" and applicable legal requirements.
16	Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	During the construction stage we use designer supervision. During operation, we ensure internal control on the TSF condition under the corporate "TSF Management System". **There are several types of control checks:** **Scheduled:** **a)** Level 1 — carried out by an employee responsible for the TSF at the operation; **b)** Level 2 — carried out by other technical specialists at the operation; **c)** Level 3 — carried out by representatives of Polymetal Management Company (as consulting). **Unscheduled:** **a)** in case of system processes review — initiated by the Company's Top Management (Group CEO, COO, managing director of the project); **b)** in case of multiple violations of legislative, regulatory and other requirements, applied to the TSF; **c)** in case of identifying adverse trends as a result of statistics analysis; **d)** in case of accidents (emergencies) affecting safety level at the TSF.
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?	In process. Analysis is currently being undertaken and will be completed later in 2019.
18	Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	**a)** No. **b)** No. Reclamation Program will be developed in details by the time of the TSF closure.

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?	When preparing the potential damage estimation (clause 17), we will consider climate change.
20	Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.	• Dams No 1, 2, 3 are of rock-fill type. • Dam No 1 is raised in 4 phases, with total height of 34.5 m. • Dam No 2 is raised in 1 phase, with height up to 7.5 m. • Dam No 3 is raised in 1 phase, with height up to 16.5 m. • Rock fill buttressing. • On the upstream slope there is impermeable screen of geomembrane up to the dam crest. • On the downstream slope there is pipe drainage. • Inclination angle of upstream slope — 1:3. • Downstream slope — 1:2.5. • The normative safety factor adjusted for this category of facility for solidity and consequences significance should be equal or more than 1.20. • Safety factor calculated for the current TSF equals 1.3. • We have a complete package of design documentation and permits on hand. • TSF is located in a region prone to earthquakes and has the potential to experience ground shaking levels of Intensity 6 (VI). • The watershed area is 1,067 km^2. • The TSF is dyked (hydro-protected) by a network of interception channels and a stream diversion channel, designed to hold maximum seasonal and rainfall flood flows with 1% annual exceedance probability. • Spill discharge volume is estimated at 1,110,000 m^3. • The area flooded in case of hydrodynamic accident would be 0.1 km^2. • Overfilling of the TSF impoundment and the spill over the dam crest may occur in case of: — receiving a surface runoff with 1% Annual Exceedance Probability, — failure of the stream diversion channel and interception channel (including timely snow clearing) and — uncontrolled filling of the TSF with simultaneous suspension of water withdrawal from it. • The likelihood of a hydrodynamic accident has been estimated to be minimal because the design provides for at least 2 m freeboard between the TSF filling level and the dam crest elevation.

Kyzyl TSF location and affected area in case of dam failure

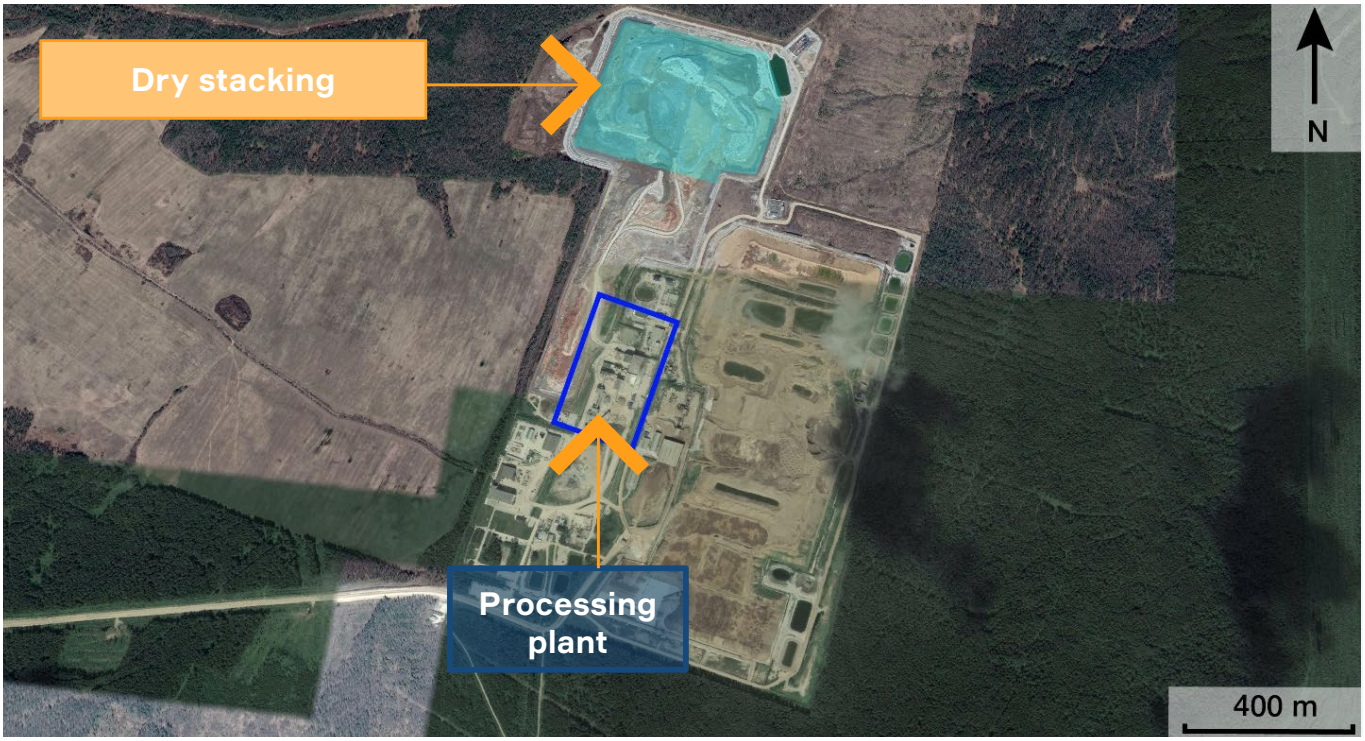


Voro DSF

1	"Tailings Facility" Name/identifier	**Voro DSF**
2	Location	N 59°39′7″ E 60°18′57″
3	Ownership	Gold of Northern Urals Joint Stock Company
4	Status	Active
5	Date of initial operation	2000
6	Is the Dam currently operated or closed as per currently approved design?	Operated as per currently approved design
7	Raising method	Dry stacking of tailings
8	Most recent Independent Expert Review	February 2019 — audit under the Cyanide Code by Wardell Armstrong International. 9.02.2018 — by inspection team (representatives of the company-operator, Russian Federal Environmental, Industrial and Nuclear Supervision Service (Rostechnadzor) and Ministry of Emergency Response).
9	Do you have full and complete relevant engineering records including design, construction, operation, maintenance, and/or closure?	• Primary Ore Processing Area Upgrading to Increase Throughput to 900,000 tpa, 2008. JSC Polymetal Engineering. • Technical Project of the Vorontsovskoye Gold Deposit Development and Mining, 2013. JSC Polymetal Engineering. • Maintenance manual is a part of Plant Maintenance Procedures.
10	What is your hazard categorization of this facility, based on the consequence of failure?	Non-hazardous
11	What guideline do you follow for the classification system?	Federal Law "On industrial waste" as of 24.06.1998 No. 89-FZ (with amendments). Federal Law "On protection of the environment" as of 10.01.2002 No. 7-FZ (with amendments).
12	Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	During the construction stage we use designer supervision. During operation, we ensure internal control on the storage condition under the corporate procedures.
13	Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	**a)** There is a closure plan. A land reclamation section is included in the design documentation. **b)** As for now, the closure plan does not include long term monitoring. The program is a part of a Reclamation Project and will be developed in detail by the time of the TSF closure.

14	Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.	• Tailings produced from the gold recovery process are sent to the filtration system, where the filtrate is collected and recirculated in the process (closed loop system). The filter cake (dry tailings) with less than 20% moisture are deposited in the dry stack facility (DSF). • The DSF is geosynthetically lined with a 1.5 mm HDPE geomembrane. • The basement of the DSF is levelled to create a gradient towards the slopes to prevent stagnation of surface storm and melted waters. Geogrid is laid on the slopes to prevent slope slipping and stabilize the protection clay layer. • Surface water runoff from the DSF is captured along the perimeter with drainage ditches lined with 1.0 mm geomembrane and flows to the surface water runoff pond, and flows to the water treatment plant before being discharged. • The DSF represents a dump formed in layers with total capacity of 8,720,000 m^3. • The safety factor calculated for this type of storages equals 1.20 and the adjusted stability factor for the current DSF equals 1.23.

Voro DSF location and affected area in case of dam failure

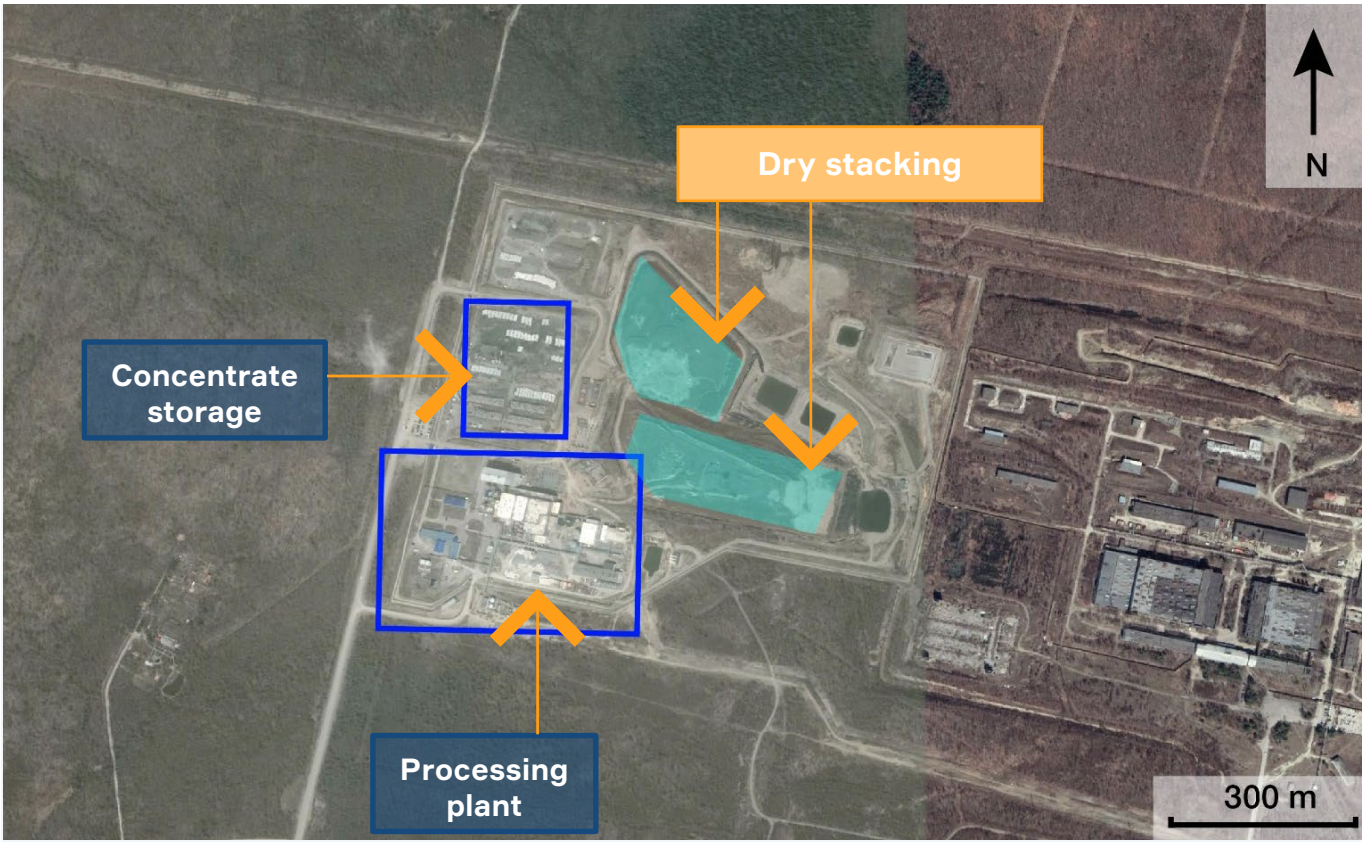


Amursk DSF

1	"Tailings Facility" Name/identifier	**Amursk DSF**
2	Location	N 50°15′18″ E 136°49′31″
3	Ownership	Amur hydrometallurgical plant Limited Liability Company
4	Status	Active
5	Date of initial operation	2012
6	Is the Dam currently operated or closed as per currently approved design?	Operated as per currently approved design
7	Raising method	Dry stacking of tailings
8	Most recent Independent Expert Review	November 2018 — audit under the Cyanide Code by Wardell Armstrong International. 8.06.2018 — by inspection team (representatives of the company-operator, Russian Federal Environmental, Industrial and Nuclear Supervision Service (Rostechnadzor) and Ministry of Emergency Response).
9	Do you have full and complete relevant engineering records including design, construction, operation, maintenance, and/or closure?	• Construction of Amursk POX, 2009 by JSC Polymetal Engineering. • Maintenance manual is a part of POX Plant Maintenance Procedures.
10	What is your hazard categorization of this facility, based on the consequence of failure?	Non-hazardous
11	What guideline do you follow for the classification system?	Federal Law "On industrial waste" as of 24.06.1998 No. 89-FZ (with amendments). Federal Law "On protection of the environment" as of 10.01.2002 No. 7-FZ (with amendments).
12	Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	During the construction stage we use designer supervision. During operation, we ensure internal control on the storage condition under the corporate procedures.
13	Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	**a)** There is a closure plan. A land reclamation section is included in the design documentation. **b)** As for now, the closure plan does not include long term monitoring. The program is a part of a Reclamation Project and will be developed in detail by the time of the TSF closure.

14	Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.	• Tailings produced from the gold recovery process are sent to the filtration system, where the filtrate is collected and recirculated in the process (closed loop system). The filter cake (dry tailings) with less than 30-33% moisture are deposited in the dry stack facility (DSF). • The DSF is geosynthetically lined with a 1.5 mm HDPE geomembrane. • The basement of the DSF is levelled to create a gradient towards the slopes to prevent stagnation of surface storm and melted waters. Geogrid is laid on the slopes to prevent slope slipping and stabilize protection clay layer. • Surface water runoff from the DSF is captured along the perimeter with drainage ditches lined with 1.0 mm geomembrane and flows to the surface water runoff pond, and flows to the water treatment plant before being discharged. • The DSF represents a dump formed in layers with total capacity of 6,656,000 t for first 18 years of operation: 1,745,400 for current (March 2019) and 4,913,600 for further storage. • Safety factor calculated for this type of storages equals 1.20. Adjusted stability factor for the current DSF equals 1.42.

Amursk DSF location and affected area in case of dam failure



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