

Panguna Mine Legacy Impact Assessment

**Phase 1 Assessment Report
Volume II Part B
Guide to the Report**

Panguna Legacy Assessment Company Limited



PANGUNA MINE LEGACY IMPACT ASSESSMENT

Phase 1 Assessment Report Volume II Part B

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STRUCTURE

The Panguna Mine Legacy Impact Assessment Phase 1 Assessment Report comprises three volumes structured as follows.

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SPECIFIC TERMS

Specific terms relevant to the scope of work are outlined below. Many of these terms are aligned with the Primary Contractor Scope of Work (Rio Tinto Limited and HRLC 2022). Where the term and or definition is verbatim from the scope of work, this is indicated in this list with italics. Refinements to some definitions from the scope of work have been made to provide greater clarity regarding the use of the terms.

Key definitions relevant to this report and the impact assessment process are:

- **active:** represents where the investigation has found that indicators for that aspect are not within the agreed guideline values and may be of concern.
- **actual impact:** *an adverse impact that has occurred, or persisted, since mining ceased in 1989 (historic) or is occurring.*
- **acute:** the adjective used to describe the actual and potential impacts targeted in Phase 1 as per the scope of work. Acute in this context is used to refer to extreme, severe or very serious actual and potential impacts. This definition of acute is distinct from the definition of acute in association with health-related impacts (see definition of acute (health) below).
- **acute (health):** short term exposure to a substance or condition that has the potential to cause immediate health impacts.
- **background sample:** sample collected from a location that is not impacted by the Panguna Mine, relevant to the type of sample being collected. Data gathered from background locations is used as a reference to understand mine-related impacts.
- **conceptual site model (CSM):** a framework used to describe how hazards from a source can travel through various pathways to reach the environment or community. This model helps identify and understand the relationships between sources, pathways and end points. A single source can have multiple pathways and/or end points.
- **cessation of mining:** when mining ceased at the Panguna Mine in 1989.
- the **Complaint:** the complaint and addendum lodged by the Human Rights Law Centre (HRLC) representing 170 residents of mine impacted communities with the Australian National Contact Point for Responsible Business Conduct against Rio Tinto Limited.
- the **Complainants:** the 170 residents of villages in Bougainville who are represented by the HRLC in the Complaint.
- **Complaints Mechanism:** the formal Complaints Mechanism developed by the Oversight Committee to support rights-holders to access remedy related to the conduct and process of the Legacy Impact Assessment (not the results). Complaints received in relation to Tetra Tech Coffey's work in undertaking the Legacy Impact Assessment are reported to the Secretariat for resolution. Tetra Tech Coffey is responsible for reporting all direct complaints received to the Secretariat and implementing the resolutions of complaints as agreed with the Secretariat.
- **Detailed Investigation Plan:** reports detailing individual environmental and social scopes of work and sampling plans. These plans are designed to identify and confirm potential impact pathways. The plans were prepared by Tetra Tech Coffey's technical specialists and independently reviewed before approval from the Technical Sub-Committee and endorsement by the Oversight Committee.

- **directly connected¹ (social and human rights impact):** actual, potential and possible social and human rights impacts resulting straight (without intervening or intermediary factors) *from environmental impacts caused by the mine since the cessation of mining in 1989*. Directly connected social and human rights impacts are within the scope of the Legacy Impact Assessment, other social and human rights impacts that are not directly connected are not within the scope and while they may be noted, are not assessed. The identification of the directly connected impacts in some cases may not be clear-cut and in these cases a conservative approach will be taken, i.e., when in doubt, the impact will be included.
- **domain:** a description of the different areas or zones within the study area. There are four domains:
 - Mine Domain
 - River System Domain
 - Delta Domain
 - Port and Town Domain.
- **end point:** places and receiving environments where people and/or ecological receptors are potentially exposed to contaminants or hazards, often referred to as exposure points. In the context of the Legacy Impact Assessment, the end point must be linked to a mine related source and exposure pathway.
- **environmental impacts:** refers to the impacts to the biophysical and physical environment including natural and physical resources (land, water, soil, air) and the ecosystems they support. It also includes mine-related structures and landforms as part of the biophysical environment.
- **environmental impact caused by the mine:** adverse mine-related effects on the environment for which there is a complete pathway between the source and the end point in the conceptual site model for the Legacy Impact Assessment. Environmental impacts caused by the mine *since the cessation of mining in 1989* are within the scope of the Legacy Impact Assessment, other environmental impacts that are not caused by the mine are not within the scope and while they may be noted, will not be assessed.
- **human rights:** internationally recognised standards that provide for dignity and equality for all human beings. These rights are outlined in International Bill of Human Rights, the United Nations Declaration on the Rights of Indigenous Peoples, Convention on the Elimination of All Forms of Discrimination against Women, Convention on the Rights of the Child, Convention on the Rights of Persons with Disabilities, International Convention on the Elimination of All Forms of Racial Discrimination and the International Labor Organization's Declaration on Fundamental Principles and Rights at Work. For this Legacy Impact Assessment, human rights related to labour rights (e.g., Right to Equal Pay for work of Equal Value, Right to Freedom of Association) are out of scope.
- **Imminent Severe Risk:** human rights risk that is irremediable, likely or almost certain, occurring in the near term and before the conclusion of Phase 1 of the Legacy Impact Assessment; and within scope of the Legacy Impact Assessment. Follows the Imminent Severe Risk Process developed by the Parties to the Complaint to provide a mechanism for escalating Imminent Severe Risks to human rights identified during Phase 1.
- **inactive:** represents where the investigation has found that the environmental conditions for that aspect at that location are within the agreed guideline values, or have been assessed by the specialist scientist as not of concern.
- **Independent Facilitator:** chairs the Oversight Committee for the Panguna Mine Legacy Impact Assessment. The Independent Facilitator is independent from ABG, Government of PNG, Rio Tinto Limited or the Complainants.

¹ The UNGPs (2011) language relating to the association of impacts (i.e., caused, contributed and directly linked) to a business enterprise as part of a human rights impact assessment process has not been adopted for this Legacy Impact Assessment. This is because in the context of this assessment there is no business enterprise that the human rights impact assessment is considering.

- **Legacy Impact Assessment:** an independent environmental, social and human rights impact assessment of the *actual and potential environmental impacts caused by the Panguna Mine since the cessation of mining in 1989 and the social and human rights that are directly connected to these environmental impacts.*
- **Oversight Committee:** the Panguna Mine Legacy Impact Assessment Oversight Committee. A joint committee of stakeholders formed to oversee the Legacy Impact Assessment. This Oversight Committee was established by the Autonomous Bougainville Government (ABG) and the parties to the AusNCP process (Rio Tinto Limited, HRLC and the community members the HRLC represents). It is chaired by an independent facilitator and includes representatives from the Independent State of Papua New Guinea, BCL, and other landowners and community representatives.
- **parties to the Complaint:** Rio Tinto Limited and the Complainants, represented by HRLC.
- **pathway:** the migration mechanism of a contaminant or physical risk from a source to an end point. In order for an impact to be assessed, there must be a complete actual or potential pathway between the source and the end point.
- **possible impact:** a credible social or human rights impact that could be directly connected to an actual environmental impact but there is insufficient information to determine if there is an actual social or human rights impact or not.
- **post-1989:** timeframe of the scope of the Legacy Impact Assessment. Within scope are environmental impacts of the mine that have continued post 1989 and social and human rights impacts directly connected to those impacts. In practice this means that the environmental impacts associated with the physical changes that occurred as a result of the construction and operation of the mine up until 1989 are not in scope, for example impacts associated with the establishment of infrastructure (e.g., road, port, Arawa and Panguna towns), creation of the open pit, deposition of waste rock and riverine disposal of tailings. Any ongoing or new emissions from these features (e.g., dust, seepage, runoff) are, however, in scope. Regarding riverine disposal of tailing, environmental impacts from changes in the spatial distribution of tailing and associated flooding regime since 1989 are in scope. From a social and human rights perspective this means that resettlement and displacement associated with the original development of the mine, establishment of infrastructure, placement of the waste rock dumps, open pit and 1989 tailing footprint are not in scope, nor are the distribution of social benefits during the mine's operation. However, social displacement that has occurred due to emissions or movement of mine waste material into new areas post-1989 is in scope.
- **potential impact:** an adverse impact that may occur but has not yet done so.
- **Phase 1:** the first of two stages of the Panguna Mine Legacy Impact Assessment. Phase 1 will comprise identifying, using a combination of field investigations and predictive assessment and modelling, acute actual and potential impacts, focused on what the Complainants have identified as the most serious known likely impact areas for local populations. Tetra Tech Coffey is the Primary Contractor for Phase 1.
- **Phase 2:** currently envisaged to follow Phase 1 and may involve a targeted review of any remaining areas of concern as required to assess any remaining actual or potential environmental impacts caused by the mine and any remaining actual or potential social and human rights impacts directly connected to the environmental impacts. The nature and scope of Phase 2 will be dependent on the outcomes of Phase 1 and further discussion with the Parties.
- **Preparatory Phase:** the first stage of the Legacy Impact Assessment. The objectives of the Preparatory Phase were to develop a fact base of the Panguna Mine's environmental issues, infrastructure state, key population characteristics and communities at risk of flooding. Furthermore, it aimed to identify data/knowledge gaps and areas of further study and provide baseline information for the Legacy Impact Assessment.

- **Preparatory Phase Report:** a factual report produced during the Preparatory Phase, preceding Phase 1. Prepared by Tetra Tech Coffey.
- **salience [of human right impacts]:** refers to the importance or prominence of the human right impact to people (i.e., the rights' holders). Salient human right impacts are those that are most severe based on their scale, scope and irremediable character. The likelihood or probability of an impact is taken into account as a secondary consideration.
- **scope of work:** The scope of work for Phase 1 of the Legacy Impact Assessment as defined in the Primary Contractor Scope of Work document issued to Tetra Tech Coffey (Rio Tinto Limited and HRLC 2022).
- **Secretariat:** an organisation supporting the management and administration of the Panguna Mine Legacy Impact Assessment process. The Secretariat provides support to the Oversight Committee, Technical Sub-Committee and Independent Facilitator. The Secretariat manages the Independent Contractor (Tetra Tech Coffey) and manages the Complaints Mechanism. The Secretariat provides independent culturally sensitive advice and recommendations, management, community engagement and logistical support.
- **source:** the initial location or activity of possible contamination or physical risk. A source in the context of the Legacy Impact Assessment must be directly related to the mine and its operation until cessation of mining in 1989 and associated with an impact pathway and end point..
- **Technical Sub-Committee:** The Technical Sub-Committee provides technical advice to the Oversight Committee to support decision-making about the impact assessment. The Technical Sub-Committee is made up of five independent technical experts (not the Primary Contractor) and includes members who together have the following technical skillsets: human health, social and communities, human rights, environmental, geomorphology and geotechnical.
- **vulnerability:** refers to the inherent susceptibility of individuals or groups, assets or other social attributes to the scale of an impact based on social, economic and/or environmental factors or processes. Vulnerability is considered and defined within the local context.

GLOSSARY

Terms	Part of speech	Definition
100-year flood	<i>n</i>	a flood event that has a 1% chance of occurring in any given year.
acid and metalliferous drainage (AMD)	<i>n</i>	the process where sulfide minerals in ore and waste rock react with air and water, producing acidic water containing dissolved metals.
acidic	<i>n</i>	pH less than 7.
alkaline	<i>adj.</i>	having the properties of an alkali or containing alkali; having a pH greater than 7.
alluvial	<i>adj.</i>	pertaining to material, such as sand or silt, deposited by running water (e.g., a creek or river).
alluvium	<i>n</i>	deposit of clay, silt, sand and gravel left by flowing streams in a river valley or delta, typically producing fertile soil.
annual recurrence interval (ARI)	<i>n</i>	the estimated interval of time between events of a certain intensity or size, such as floods.
anthropogenic	<i>adj.</i>	originating from human activity.
artisanal and small-scale mining (ASM)	<i>n (abbr)</i>	mining conducted by individuals or small groups using minimal technology and machinery.
basin	<i>n</i>	an area of land drained by a river, creek and its tributaries.
bathymetry	<i>n</i>	study or measurement of waterbody 'beds' or 'floors'.
benthic	<i>n</i>	occurring on the bottom, or in the bottom sediments.
biota	<i>n</i>	animals and plants of a region or period.
braided channels	<i>n</i>	refers to river channels that are divided into multiple smaller channels that intertwine.
carbonate	<i>n</i>	a sediment or a sedimentary rock formed by the precipitation of organic or inorganic carbon from an aqueous solution of carbonates of calcium, magnesium, or iron. Limestone is a carbonate rock.
catchment	<i>n</i>	the collection of rainfall over a natural drainage area.
circumneutral	<i>adj</i>	pH between 6.5 to 7.5.
community safety	<i>n</i>	the state where people feel safe and protected from harm, whether from others or environmental hazards.
concentrator plant	<i>n</i>	a facility where ore is processed to increase the concentration of valuable minerals.
confluence	<i>n</i>	the point where two rivers or streams meet.
contaminant	<i>n</i>	substances that cause pollution or contamination.
cultural heritage	<i>n</i>	the legacy of physical artifacts and intangible attributes of a group or society, including traditions, language, and knowledge.
debris flow	<i>n</i>	mudslide or landslide
dewatering	<i>n</i>	the process of pumping or draining water from an excavation.
dewatering tunnel	<i>n</i>	a tunnel used to remove water from the open pit.
discharge	<i>adj.</i>	removal of water from or flow out of an aquifer, including flow to surface water, another aquifer, or artificial means such as pumping.
disturbance	<i>n</i>	the physical displacement of existing features that may lead to impacts.
diversion	<i>n</i>	the process of changing the direction or course of something, such as a river.

Terms	Part of speech	Definition
drainage	<i>n</i>	a hydrologic process where surface or sub surface water flows within an area or a catchment.
ecosystem	<i>n</i>	a biological community of interacting organisms and their physical environment.
electrical conductivity (EC)	<i>n (abbr)</i>	a measure of water's capacity to conduct electricity which allows estimation of the concentration of dissolved ions (i.e., salts).
emissions	<i>n</i>	the production and discharge of something, e.g., gas or liquid.
endemic	<i>adj.</i>	of a plant or animal, native or restricted to a certain place.
endpoint	<i>n</i>	places and receiving environments where people and/or ecological receptors are possibly exposed to contaminants or hazards, often referred to as exposure points. In the context of the Legacy Impact Assessment, the end point must be linked to a mine related source and exposure pathway.
enumerator	<i>n</i>	a person employed to conduct household surveys for the social, health and human rights characterisation.
erosion	<i>n</i>	the process of gradually wearing away exposed soil, earth, or rock surfaces by an abrasive action such as wind and water or other natural agents.
exceedance (of screening criteria or guidelines)	<i>n</i>	where concentrations of chemicals in water, soil or food are higher than defined levels in guidelines.
fauna	<i>n</i>	the animals of a particular region, habitat, or geological period.
flooding	<i>n</i>	the overflow of water onto normally dry land
flora	<i>n</i>	the plants of a particular region, habitat, or geological period.
fluvial	<i>adj.</i>	of or found in a river.
fluvial geomorphology	<i>n</i>	the study that describes the size, shape and diversity of the river channel and the processes by which these elements form and change through time
fractured rock	<i>n</i>	a geological formation that is divided into two or more pieces by a separation such as a joint or a fault.
geomorphology	<i>n</i>	the study of the form of the earth.
geotechnical	<i>adj.</i>	means behaviour of earth and materials
groundwater	<i>n</i>	water stored in geological formations below the land surface.
hazard	<i>n</i>	a source that has the potential to cause harm.
historic impact	<i>n</i>	an adverse effect that occurred in the past and may still be present.
hydrocarbon	<i>n</i>	organic compounds consisting entirely of hydrogen and carbon, often used as fuel (e.g., diesel).
hydrogeology	<i>n</i>	the study of water occurring underground (groundwater).
hydrology	<i>n</i>	the study of the properties of the earth's water, especially movement in relation to land.
impact pathway	<i>n</i>	the route through which an impact travels from the source to the end point.
industrial chemicals and materials	<i>n</i>	chemicals from various mine facilities used to support the mine, for example, fuel tanks, electrical infrastructure, processing chemicals.
infrastructure	<i>n</i>	the supporting installations and services that supply the needs of a project.
in-migration	<i>n</i>	the movement of people into a region or area to live or work.
kinetic testing	<i>n</i>	evaluates the rate of acid generation in the sample. Kinetic analyses results in two key indicators: the lag time associated with sulfide oxidation and the rate of sulfide oxidation.

Terms	Part of speech	Definition
lag time	<i>n</i>	the period it takes for acidic conditions to develop. During the lag time, sulfide minerals in the material samples may undergo initial reactions to oxidise; however, the conditions that generate AMD may not have fully developed. This could be a result of minerals with acid-neutralising capacity within the sample, or other neutralising factors.
landform	<i>n</i>	a feature of the earth's surface.
leachate	<i>n</i>	liquid that is generated from water percolating through any permeable material.
LiDAR	<i>abbr.</i>	light detection and ranging; a detection system that works on the principle of radar but uses light from a laser. LiDAR data was obtained for the study area from a fixed wing aircraft.
liquefaction	<i>n</i>	process of making or becoming liquid.
magnetite	<i>n</i>	a magnetic iron oxide mineral commonly associated with ore deposits.
metal precipitate	<i>n</i>	a process used to recover or remove metals and metalloids from leachates.
milling	<i>n</i>	the process of grinding ore into smaller pieces to extract valuable minerals.
open pit	<i>n</i>	a large hole dug to extract ore and minerals.
ore	<i>n</i>	a natural aggregation of one or more minerals that can be mined, processed, and sold at a profit.
organic carbon	<i>n</i>	carbon found in organic compounds, which are essential for plant growth.
overbank flows	<i>n.</i>	water that flows over the banks of a river during flooding.
oxidise/oxidising	<i>vb</i>	combining chemically with oxygen.
particulate	<i>adj.</i>	of, relating to, or in the form of minute separate particles.
perched water table (or aquifer)	<i>n</i>	groundwater that forms above a layer of lower permeability material within an unsaturated zone where the migration of percolating recharge is slowed to the extent that it saturates the porous material above an aquitard/aquifer.
permeability	<i>n</i>	a material's capacity to transmit fluids.
pH	<i>n (abbr)</i>	a figure expressing the acidity or alkalinity of a solution on a logarithmic scale on which 7 is neutral, lower values are acidic and higher values are alkaline.
plagioclase	<i>n</i>	a series of feldspar minerals that share chemical compositions but vary in the relative proportions of sodium, calcium, and aluminium.
polychlorinated biphenyls (PCBs)	<i>n (abbr)</i>	an organic based compound produced by replacing hydrogen atoms in biphenyl with chlorine, which have various industrial applications and are generally toxic to the environment.
processing and milling area	<i>n</i>	facilities where ore is processed and ground into smaller pieces.
processing infrastructure	<i>n</i>	facilities and equipment used to process mined materials.
reagents	<i>n</i>	substances used in chemical reactions to detect, measure, examine, or produce other substances.
receiving environment	<i>n</i>	the area or ecosystem that receives contaminants or physical impacts.
recharge	<i>adj.</i>	addition of water to, or flow into, an aquifer.
remediation	<i>n</i>	the act of process of remedying a situation or impact. This includes actions to clean up or mitigate environmental harm and ensuring that the affected communities' rights to health, safety, and a clean environment are upheld.
revegetated	<i>adj.</i>	areas where vegetation has been re-established after being disturbed.
rightsholders	<i>n</i>	individuals or groups who hold entitlements under human rights laws and standards.

Terms	Part of speech	Definition
risk	<i>n.</i>	the likelihood and severity of the harm that the hazard could cause.
runoff	<i>n. or adj.</i>	portion of water that flows from a specific land area, surface or facility; water shedding from the land or a facility.
saliency	<i>n</i>	the importance or prominence of an issue, used to prioritize the remedy of human rights impacts based on their severity and likelihood.
salinity	<i>n</i>	the dissolved salt content of a body of water. Measured using electrical conductivity (EC).
sedimentation	<i>n</i>	particulate matter that is carried by water or wind and deposited on the surface of the land or the bed of a waterbody.
sediments	<i>n</i>	the solid material that can be transported through a channel by stream flow.
seepage	<i>n</i>	the slow escape of a liquid or gas through porous material or small holes.
soil	<i>n</i>	the upper layer of material covering the Earth's surface. It comprises inorganic and organic particles, air, water and living organisms.
Special Mining Lease (SML)	<i>n (abbr)</i>	a designated area where mining activities are permitted.
species	<i>n</i>	the basic category of biological classification, intended to designate a single kind of animal or plant, any variations existing among the individuals being regarded as not affecting the essential sameness which distinguishes them from all other organisms within the category.
static testing	<i>n</i>	gives an indication of the acid-generating potential of the soil or rock sample as a whole.
structural /geotechnical hazard	<i>n. or adj.</i>	unstable structures and landforms
substation	<i>n</i>	a part of an electrical generation, transmission, and distribution system where voltage is transformed from high to low or the reverse.
surface water	<i>n</i>	water that collects on the surface of the ground, such as rivers, lakes, and streams.
swampland	<i>n</i>	an area intermittently or permanently covered with water and having vegetation.
tailings	<i>n</i>	the materials left over after the process of separating the valuable fraction from the ore.
tailings discharge point	<i>n</i>	the location where tailings were released from the processing plant.
topography	<i>n</i>	the arrangement of the natural and artificial physical features of an area.
turbidity	<i>n</i>	muddiness created by stirring up sediment or having foreign particles suspended. Measured by shining a light through the water and reported in nephelometric turbidity units.
Ward area	<i>n</i>	the smallest administrative unit within Papua New Guinea's national government structure. In Bougainville, wards are clustered into Community Government areas, which are equivalent to local level governments in Papua New Guinea's national system.
waste rock	<i>n</i>	a heterogeneous (coarse materials mixed with fines) material that must be removed to reach the ore. The ore is then removed, crushed and refined using various enrichment methods that extract the desired metal and/or mineral.
water security	<i>n</i>	access to sufficient, safe, and affordable water for various uses.
watercourses	<i>n</i>	natural or artificial channels through which water flows, such as rivers, creeks, and streams.

Notes: (*n*) noun; (*adj.*) adjective; (*vb*) verb; (*abbr*) abbreviation

ABBREVIATIONS

Acronyms/Abbreviations	Definition
Symbols	
~	approximately
%	percent
>	greater than
≥	greater than or equal to
µm	micrometre
µS/cm	microsiemens per centimetre
A	
ABG	Autonomous Bougainville Government
Ag	silver
Al	aluminium
ALS	Australian Laboratory Services
AMD	acid and metalliferous drainage
ANZG	Australian and New Zealand Guidelines for Fresh and Marine Water Quality default guideline values (DGV's) for freshwater aquatic ecosystem protection (80%, 90% and 95% Protection) and irrigation long term trigger values (2018)
ARD	acid rock drainage
ARoB	Autonomous Region of Bougainville
As	arsenic
ASM	artisanal and small-scale mining
ASS	acid sulfate soils
AusNCP	Australian National Contact Point for the OECD Guidelines for Multinational Enterprises
B	
B	boron
Ba	barium
BCL	Bougainville Copper Limited or its predecessor companies (e.g., Bougainville Copper Pty Limited)
Be	beryllium
Bi	bismuth
BTEXN	Benzene, toluene, ethylbenzene, xylene, naphthalene
C	
CCME	Canadian Councils of Ministries for the Environment
Cd	cadmium
Co	cobalt
COPC	contaminant of potential concern
CPAM	(Cationic) polyacrylamide monomers – a chemical flocculant used in the mining process
Cr	chromium

Acronyms/Abbreviations	Definition
CR	critically endangered (classification term for endangered species)
CRA	CRA Exploration Pty Limited, part of the Conzinc Rio Tinto Limited of Australia corporate group, a predecessor to the Rio Tinto Limited corporate group.
Cs	caesium
CSM	conceptual site model
Cu	copper
D	
DD	data deficient (classification term for endangered species)
DGV	default guideline value
DIIS	Department of Industry, Innovation and Science
DIP	Detailed Investigation Plan
DSI	detailed site investigation – referring to part of the contaminated sites investigation process as listed in the National Environment Protection Measure (2013)
DTM	digital terrain model
DW	drinking water
E	
EA	United Kingdom Environment Agency
EC	electrical conductivity
Eh	redox (oxidation-reduction)
EIA	Environmental Impact Assessment
EN	Endangered
enHealth	Australian Environmental Health Standing Committee Guidelines
Eu	europium
F	
FAO	Food and Agricultural Organisation
Fe	iron
FFA	flood-frequency analysis
FGD	focus group discussions
FIMS	Forestry Inventory Management System
FSANZ	Food Standards Australia New Zealand
G	
Ga	gallium
Gd	gadolinium
Ge	germanium
GEL	Generally Expected Level
GIS	geographic information system
GNSS	Global Navigation Satellite Systems
g/t	grams per tonne
GV	guideline value
GW	groundwater

Acronyms/Abbreviations	Definition
H	
ha	hectare
ha/year	hectare(s) per year
Hf	hafnium
Hg	mercury
HIL	health investigation level
HRLC	Human Rights Law Centre
I	
IUCN	International Union for Conservation Nature
J	
JECFA	Joint Expert Committee on Food Additives
K	
K	potassium
km	kilometres
km ²	square kilometre
kW	kilowatt or kilowatts
L	
La	lanthanum
LC	least concern (classification term for endangered species)
Li	lithium
LIA	Legacy Impact Assessment
LiDAR	light detection and ranging
LLG	Local Level Government
LOD/LOR	limit of detection/limit of reporting
M	
m	metres
MBS	market basket survey
Mg	magnesium
mg/kg	milligrams per kilogram
mg/L	milligrams per litre
MIBC	Methyl isobutyl carbinol – a chemical frother used in the mining process
MIR	mine influenced rivers
Mn	manganese
Mo	molybdenum
MPI	Multidimensional Poverty Index
m/s	metre per second
m ³ /s	cubic metre per second
Mt	million tonnes
mV	millivolt
MW	megawatt or megawatts

Acronyms/Abbreviations	Definition
N	
NA	not applicable
NAF	non-acid forming
Nb	niobium
Nd	neodymium
NDC	North Diversion Channel
NE	not established
NEPM	National Environment Protection Measure
NHMRC	National Health and Medical Research Council (NHMRC), Australian Drinking Water Guidelines (2022).
Ni	nickel
NMD	non-metalliferous drainage
NSPG	North Solomons Provincial Government
NT	Near Threatened
O	
OECD	Organisation for Economic Co-operation and Development.
P	
PAF	potentially acid-forming, referring to material potentially generating acid and metalliferous drainage
PAHs	polycyclic aromatic hydrocarbons
PAM	polyacrylamide monomer
Pb	lead
PCBs	polychlorinated biphenyls
PFAS	perfluorinated and polyfluorinated alkyl substances – chemicals of concern with a risk of causing adverse effects to human health and the environment
PFHxS	perfluorohexane sulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
pH	Quantitative measure of the acidity or alkalinity of a solution on a logarithmic scale on which 7 is neutral
PISW	processing-impacted surface waters
PLA	Panguna Landowners Association
PMAR	Port to Mine Access Road
PMV	public motor vehicle
PNG	Papua New Guinea
PNG DW	PNG Public Health (Drinking Water) Regulation (1984)
PNG ER	PNG Environment (Water Quality Criteria) Regulation (2002)
Q	
QAQC	quality assurance and quality control – referring to chemical analysis

Acronyms/Abbreviations	Definition
R	
Rb	rubidium
REE	rare earth elements
RMTL	Road Mining Tailings Leases Trust
RORB	Runoff Routing Program
RSL	regional screening level
S	
Sb	antimony
Se	selenium
SML	Special Mining Lease
Sn	tin
SO ₄	sulfate
Sr	strontium
SRTM	Shuttle Radar Topography Mission
SVOCs	semi-volatile organic compounds
T	
t	metric tonne or tonnes
Ta	tantalum
Te	tellurium
Th	thorium
TKN	total kjeldahl nitrogen
Tl	thallium
TOC	total organic carbon
tpd	tonnes per day
TRH	total recoverable hydrocarbons
TSS	total suspended solids
U	
U	uranium
UHF	ultra-high frequency
UNPF	United Nations Population Fund
USEPA	United States Environment Protection Agency
V	
V	vanadium
VIP	ventilated improved pit
VOCs	volatile organic compounds
VU	vulnerable (classification term for endangered species)
W	
W	tungsten
WBS	work breakdown structure
WHO	World Health Organisation

Acronyms/Abbreviations	Definition
WRD	waste rock dump
wt.%	weight percent
Y	
Y	yttrium
Yb	ytterbium
Z	
Zr	zirconium